

MACFADDEN'S ENCYCLOPEDIA
OF PHYSICAL CULTURE

VOLUME II

This Volume is devoted to the Relation of Exercises and Physical
Training to Health and to the Cultivation of Physical Beauty

Complete Index of Contents appears at close of Volume V

MACFADDEN'S ENCYCLOPEDIA *of* PHYSICAL CULTURE

A work of reference, providing complete instructions for the cure of all diseases through physcultopathy, with general information on natural methods of health-building and a description of the anatomy and physiology of the human body

By
BERNARR MACFADDEN

assisted by

Specialists in the Application of Natural Methods of Healing

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VOLUME II

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CHAPTER I.

EXERCISES AND HOW TO USE THEM.

THE first volume of this work embraces a number of chapters upon the subject of diet, because of its prime importance in the building of health and energy. Following this, and next in importance as a means of building strength and promoting the general welfare of the body, is *exercise*. Activity is the law of life, and without a normal amount of physical exercise any degree of health worthy of the name is an absolute impossibility. In the use of the muscles, and in all of the functions of life, tissues are broken down and need repair, for which reason the most perfect and suitable foods are essential, as is also an adequate supply of the vitalizing oxygen of the air. But having attended to matters of nutrition, the next most imperative factor in the building of health and vital power is that which we will consider in this chapter.

This chapter is arranged in alphabetical form for the sake of greater advantage and convenience in reference. For the student, however, who wishes to make a thorough study of the entire subject, and who therefore purposes to read it all through, I would suggest taking up first the paragraphs under the heading, "Exercise and Its Essentials," presenting important considerations on the theory of exercise. After this the other subjects may be taken up in any order desired.

AMOUNT OF EXERCISE.—The question of the amount of exercise is a most important one, especially in the case of those who are very weak and who cannot afford to waste any vitality through excess in this or any other direction. One who is powerful and full of energy may seem practically tireless, and the greatest activity all day long may be none too much for him. But the man who is trying only to get strong should keep in mind the fact that it is his purpose to take only so much exercise as will increase his circulation, bring his muscles into play to a healthful degree, and ultimately increase

his physical energy when he has recuperated from this moderate expenditure. It should not be his purpose to consume all of his available strength and vitality in his exercises each day, for if he cannot build up that much energy every twenty-four hours he will gradually get weaker instead of stronger. It is entirely a question of recuperative power, or the power to build up, and the essential purpose should be to build up more vitality each day than is expended.

Probably one of the most common faults among young enthusiasts in physical culture is the tendency to excess in exercise. They would really improve a great deal faster in many cases if they took just one-half of the amount of exercise that they have been accustomed to, or if they reduced the amount of violent exercise one-half and greatly increased the amount of walking and other moderate constitutional exercise in the open air.

In the chapter devoted to outdoor games and competitive sports, which includes a discussion of athletic training, I am also taking up the subject of over-training, which it would be well worth reading in the present connection. However, I would say here, briefly, that it is a very simple matter to determine just the proper amount of exercise in each case if one will watch himself closely. I do not propose to lay down any rules here, for various individuals differ widely in their requirements. I would insist in all cases, however, that it is better to take a moderate or suitable amount of exercise each day than to neglect it for several days and then to try to make up for it all in one day by taking several times too much. The best guide as to the amount of exercise is individually a matter each person must learn through experience to determine for him or herself. Briefly, as long as the exercise is pleasurable, and may be taken in more or less of the spirit of play, it is doing one good, but when it becomes painful or too laborious, it has ceased to be of value from a constitutional standpoint.

This consideration must be modified to some extent in the case of athletes engaged in special training for some

definite purpose. If it is necessary to attain a certain degree of strength or of endurance, then it is necessary to gradually increase the amount of exercise in training until working up to the desired point.

ALL-ROUND ATHLETICS.—The term, "All-Round Athletics," is used not only in a general sense to indicate the practice of various games, but is also used in a specific sense to designate a well organized and popular form of athletic competition, in which important championship contests are held each year. The all-round championship has to do with a series of ten events, representing practically the entire scope of track and field athletics, all competed for in one afternoon. These various events call for speed, elasticity, strength and endurance, and to be lacking in any of these qualities is to be unfitted for successful competition in the all-round game. The winner may not be placed as first in all events on the list, but he must make the highest total percentage in all of them. Each event is judged on a percentage basis, the athletic record in each one being taken as a standard of 100 per cent., and the merit of time or distance recorded in each event computed according to a standard scale devised for the purpose. Accordingly, one need not accomplish any sensational performance in any one of the ten events, but by a uniformly good average in all may secure a greater number of points than some other who may be brilliant in the sprints and hurdles, but very poor in the weight throwing events. It need hardly be said that the practice of all-round athletics is more healthful than the pursuit of some athletic specialty, and for the most part more interesting because of the variety. Symmetry of development is absolutely necessary and the versatility acquired through the practice of all-round athletics may often be valuable later in enabling one to get even better results in some specialty, because he has all the qualifications of the perfect athlete.

In training for an all-round contest, one may feel like doing a little of each every day, but this is not a satisfactory plan. It is much better first to work for strength and endur-

ance, and then to practice specially on two or three events at a time, for two or three days.

The ten events used in the All-Round Championship of the Amateur Athletic Union are:

100 Yards' Run	Pole Vault
Putting 16-lb. Shot	120 Yards' Hurdle
Running High Jump	Throwing 56-lb. Weight
880 Yards' Walk (Half Mile)	Running Broad Jump
Throwing 16-lb. Hammer	One Mile Run

APPARATUS.—See *Gymnasiums*.

BREATHING EXERCISES.—I have discussed the subject of breathing and pure air in the general chapter upon the subject (Chapter X) in Volume I of this work. I have already pointed out the necessity for deep breathing at all times.

I wish here to refer especially to exercise for developing strength of the lungs and of the respiratory muscles, as well as lung capacity, and especially to take up the subject of breathing in exercise, or the relation of proper breathing to muscular exercises.

In our study of the anatomy and physiology of the lungs (Chapter X, Volume I), we have seen that deep breathing exercises, while invaluable at all times, are particularly beneficial when taken simultaneously with other muscular exercise, the latter creating a demand for the oxygen. Deep breathing does not necessarily mean that all the available oxygen taken into the lungs is also taken up by the blood, for this is the case only when vigorous exercise demands it. Wherefore the value of the combination of rhythmic deep breathing and walking, or breathing and other exercise, upon which I laid so much emphasis in Chapter X, Volume I. Of course, even though all the available oxygen in the air in the lungs be not consumed when one is not taking active muscular exercise, yet it is just as important that the lungs be kept full of vitalizing pure air, well proportioned in oxygen, instead of bad air deficient in this respect.

In connection with all the exercises suggested in this chapter, therefore, as well as in all of the other exercises, and sports and games in which one may indulge, he should pay special attention to his breathing. It is true that vigorous exercise will naturally induce deep breathing, and that the lungs, working automatically, tend to take care of themselves in this respect, but at the same time one can usually accomplish an increase of physical power and endurance by conscious and special attention to his breathing. For instance, if engaged in cross-country running, you will find yourself breathing deeply and heavily, as the natural response to the demands of the muscles, striving perhaps through labored inhalations to get just enough air to keep the body in action without too quickly exhausting it. But if then you will concentrate your thought upon your breathing and make it a point to expand the lung spaces a little more than the natural unconscious impulse would accomplish, to breathe a little more deeply than may seem really necessary for the purpose, then you will soon find that you are running with less suggestion of distress or of effort, that your stride is stronger and your action generally more vigorous. And if you are getting tired, the musical rhythm of breathing to every four strides, every three strides, or two, will make the effort easier and enable you to ultimately accomplish more. Of course it is understood that it is not wise to carry your exertions beyond the limits of a certain comfortable fatigue, especially if you are not a trained athlete.

The same idea is to be carried out in connection with other exercises. If the exercise seems naturally to induce deep breathing to a certain degree, then voluntarily breathe a little more freely and deeply, accomplishing the change of the air in the lungs as rapidly and perfectly as possible, and you will find that you enjoy increased power and greater ease in accomplishing whatever the exercise calls for.

For similar reasons, it is unwise to make a practice of holding the breath unnecessarily long when making some physical exertion. Compressing and tensing the abdomen

and other respiratory muscles, meanwhile closing tightly the lips and larynx and subjecting the lungs to more or less pressure of air for a few moments, will force the air into all of the cells, but this should not be continued too long. Athletes sometimes do this when concentrating on some violent or very vigorous effort, since it seems to help them in getting a "grip" on themselves, just as does clenching the fist, but holding the breath too long means poisoned air in the lungs, whereas the purpose should be always to change the air in the lungs as perfectly, rapidly and regularly as possible. Divers who acquire the ability of staying under water for a couple of minutes at a time develop a very great lung capacity, but their acquired ability in this direction is only an example of the remarkable manner in which Nature responds to special demands. With the most energetic efforts in under-water swimming, the diver cannot remain submerged more than a fraction of the time that is possible with only mild exertion, because he will exhaust the available oxygen in his lungs so much quicker.



Photograph showing the normal position of the body. This position allows the vital organs to gain freedom from all restriction.

Photograph showing point of expansion in deep breathing. Note that the body is greatly expanded in abdominal region.

Holding the breath for very long is only another name for voluntary suffocation, and if continued long enough will end in fainting. The condition is absolutely the same as when one smothers through being choked by the hand of another, and therefore it is not advisable to hold the breath beyond a period of a few moments. There is no advantage in imitating the diver, for his special training in this direction is of use only in his under-water exploits or occupation.

I would advise every one to make a special effort toward the development of a full, deep and powerful chest, even if it is necessary to neglect the biceps and other muscles farther removed from the vital organism. Exercises for the chest as for all other parts of the body will be found elsewhere in this work. I do not place this emphasis upon the importance of a splendid chest development because chest breathing is especially desired, as might be supposed, for I would always insist first upon natural abdominal breathing, or, more correctly speaking, diaphragmatic breathing, as illustrated on the pre-



Drawing in abdominal region as an aid to deep breathing. Avoid this position except when it is desired to expel all air from lungs.

Full expansion of the abdominal region with hands clasped behind head. Position of arms elevates and expands the chest and deepens the breathing.

ceding pages. The reason for developing a good chest is to provide space and freedom for the internal organs; a good chest means a good development of the heart and lungs, just as a flat and contracted chest indicates a sad deficiency in these organs and also essentially in the vital energy of the individual. The man who lives long is the man with a full, round chest, and he it is who possesses the rich, strong, vibrant voice, expressive of virility and power.

It is not that the breathing in a normal state requires the expansion of the chest, but the chest should be so spacious and well built out that even when the exhalation of the breath has been completed, in natural diaphragmatic breathing, there will still be a great deal of room in the chest and a sufficient amount of residual air. It will be remembered that the lungs are never completely emptied. In other words, we do not expel all the air in the lungs with each exhalation, nor take in an entirely new supply with each inhalation. We simply ventilate or change a great part of the air in the lungs with each breath, and it is therefore important that the chest be large and the lungs well developed. It is for this reason, also, that the exhalation of the vitiated air from the lungs in breathing exercises should be given as much attention and carried just as far as the inhalation. It is just as important for changing the air in the lungs, and will create an instinctive impulse to draw in a very deep, full inhalation following. One might almost say that consciously forced exhalation is all that is necessary to stimulate deep inhalation, or deep breathing generally.

Chest-breathing is nothing for one to be afraid of, under circumstances which naturally induce or require it. I repeat that under ordinary circumstances, diaphragmatic or abdominal breathing is the natural, normal method, and neither man nor woman should ever be so attired as to prevent it or interfere with it. But this does not mean that chest breathing is always a mistake, for in time of very vigorous exercise the body makes such a heavy demand for air that the expansion of the chest is absolutely necessary. In fast running, hard wrestling and other very fast and strenuous exertions, it is as foolish as it is un-

natural to try to confine oneself to abdominal breathing just because one has been taught that it is the approved and best method for ordinary circumstances. Indeed, in the best culture of the lungs, in many special respiratory exercises for the purpose, it is advisable to include the chest as well as the diaphragm, commencing the expansion at the waist line and below, and as the lungs fill, allowing the expansion to proceed upward until the chest also is fully expanded.

Mouth-breathing. Nor can I agree with some self-appointed interpreters of Nature who declare that mouth breathing is radically and utterly wrong in any and every circumstance, for this, like chest breathing, is a matter of occasional necessity. It is true that in ordinary circumstances mouth breathing is detrimental to a high degree and carefully to be avoided, as I have insisted upon elsewhere, but in some forms of very energetic effort, such as sprinting, tug-of-war, or anything else which taxes all of one's powers to the utmost, one simply cannot get enough air through the nostrils. There are those who teach nasal breathing even under such circumstances—indeed, will not tolerate any deviation from it in any case; but when one is forced to the limits of physical exertion such restriction of breathing is partial suffocation. In such a case one needs air in large quantities; he must get it in great gasps, without loss of time and without allowing the rapidly consumed oxygen in the lungs to become too much depleted by failure in rapidly ventilating or changing the air therein, and so mouth breathing becomes both necessary and natural. In other words, it is a sort of emergency method, and not to be condemned under such circumstances. All animals breathe naturally through the mouth when undergoing great exertion. It is true that in long distance running at a moderate pace one can breathe through the nose, and if he does so with comfort it is to be advised, but if he quickens his pace and really needs air in great quantities, he should not interfere with his vital functions by restricting his breathing to the nose. It is true that the air is not partially strained or filtered, as it were, as it is when passing through the nasal passages, but in this rapid

and somewhat violent mouth breathing the expulsive power is very great and one expels from the lungs any unfriendly organic matter and other refuse which in milder breathing might not be got rid of so quickly. The forced, strenuous mouth breathing that attends the most energetic exercise is a splendid means of cleansing the lungs, though naturally it would be prohibited to consumptives, because of the danger of hemorrhage in their cases. All vigorous breathing through either nose or mouth naturally has this lung cleansing effect.

Naturally, wherever possible or comfortable, nasal breathing is the thing, and it should be made habitual.

Exercise for Strengthening Respiratory System. Aside from the simple requirements of ordinary deep breathing, for oxygenating the blood and developing a large and healthful lung capacity, the best way actually to strengthen the lungs and respiratory muscles is by offering resistance, and it is well to take a couple of simple exercises for this purpose. Consumptives, however, should not attempt these, except mildly.

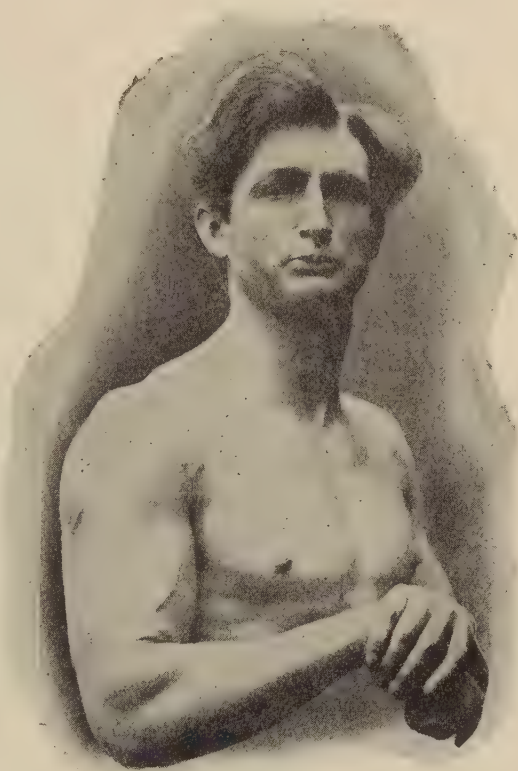
First contract the lips, in a manner not unlike the position assumed for whistling, but more firmly, so that there will be a very tiny opening, and then draw in the breath very slowly and forcibly through this small opening until the lungs have been filled to their fullest capacity. This exercise can be made as mild or as vigorous as desired by making the aperture in the lips larger or smaller, and thus decreasing or increasing the resistance. If desired a clean pipe stem or other small tube may be used, but is unnecessary. The same result can be accomplished, and perhaps more satisfactorily, by inhaling through the nose, and partially closing the nostrils with the fingers.

Next, reverse the process, exhaling through the same small opening in the lips or nostrils, and forcing the air out slowly but with power against the resistance thus afforded. After taking two or three breaths in this way, alternate by taking three or four deep breaths without such restriction, and continue the exercise. Drawing in the breath in this manner will give strength and power to those respiratory muscles used when inhaling, while exhaling in this manner will strengthen the ex-

pulling muscles. Like other breathing exercises, these should be taken either out-of-doors or in a room with windows wide open. They can be taken with advantage before commencing your regular muscular exercises, between the latter, and at odd times through the day, alternating with other breathing exercises.

The use of lung testers can sometimes be recommended as a means of stimulating interest in breathing exercises, though they are truly unnecessary. One can acquire just as perfect and satisfactory development of the lungs without them. They are really of more value as a means of occasionally testing the lung capacity than as exercises, but it is certainly true that many enthusiasts will find a certain fascination in breathing into a device that will measure in cubic inches the amount of air expelled from the lungs with each breath. And such an apparatus will enable one to see his improvement from time to time.

There is no need, however, to strive for a record in lung capacity, for an abnormal development possesses no advantage. One can even do himself harm by over-exertion in this direction, and after seriously straining the lung tissues it is necessary to avoid all full breathing exercises for a time. One should work for the maximum of normal lung development,



Contract the lips so that there will be a very tiny opening; then draw in the breath very slowly but forcibly until the lungs are thoroughly inflated. If desired, a small pipestem may be used, or by pinching the nostrils with the fingers you can partially close them, thus offering a similar resistance. After several repetitions, expel the breath in the same way, thus strengthening all of the respiratory muscles.

for this means power and vitality, but beyond this one will simply waste energy and time in his efforts. It is not wise to develop lungs cells that may not be used in the future, after losing the enthusiasm which led to such abnormal development. If the lung tester is to be used for striving to break all records in human lung capacity, it had better not be employed. It is true, however, that there is not much danger of going to excess in this direction. The great danger is through neglect of the lungs, and we can hardly say enough to encourage the general practice of deep breathing either with or without the help of apparatus.

It is entirely unnecessary to go to any lavish expenditure of money for machines for this purpose, since a home-made device can be constructed with little expense and trouble. Water is displaced by the air from the lungs, making it a simple matter to measure it.

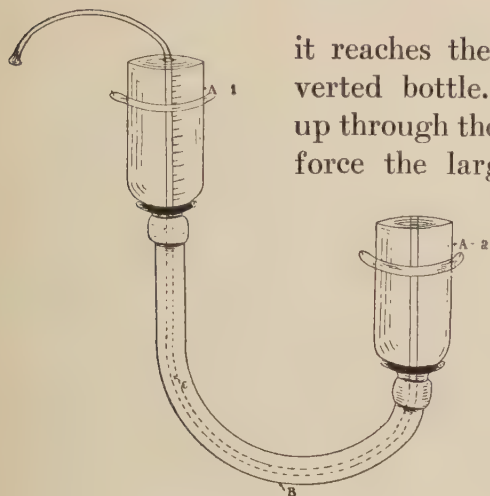
The following articles are required to make the first device illustrated. If your lung capacity is large, secure two bottles of one and one-half or two gallons in size. If your lung capacity is very moderate, a gallon bottle will do. A piece of rubber tubing, five feet in length, with an opening of about one-quarter of an inch. A large rubber tube, about eighteen inches or two feet in length, capable of stretching over the necks of the bottles. A slip of white cloth or surgeon's adhesive plaster for pasting on the outside of the upper bottle to provide a means of measurement.

After having secured the above articles, take one of the bottles to a glazier and have the bottom part of it cut off, or else



Bottles for lung tester.

cut a hole of sufficient size to admit the small tubing. Now take the two bottles and fasten them on the wall as shown in second illustration, tacking a strap around the neck, and around the upper part of each bottle. The bottle with the hole in the bottom should be placed at the top. Next place one end of a large piece of hose over the neck of the lower bottle. Now force the small hose in through the free end of the large hose until



How bottles should be arranged.

it reaches the upper end of the lower inverted bottle. Then pass the small hose up through the neck of the upper bottle, and force the large hose over the neck. The device should then look something like the illustration. After pouring in water until it has reached the full swell of the upper bottle, you are ready to mark down the measurement in cubic inches. Be sure that the water reaches the bottom of

the slip of cloth or paper which you have pasted on the bottle for marking.

Ascertain the number of quarts contained in the bottle and then place the total number of cubic inches up at the top; after which, you can divide it as often as you please. If you have no means of weighing at hand put down your figures as follows: A quart of water contains 57.6 cubic inches. Pour a quart of water in the bottle and mark down on your measure at the point which the water reaches 57.6. Put in another quart and mark 115.2; another quart, marking 172.8, and continue on in this manner. Of course, each quart can be divided into halves and quarters and tenths, if you desire to get the exact number of cubic inches you are able to blow.

After having completed your measurement data, remove from the bottle the exact amount of water poured in for measuring purposes. Now fully fill the lungs, and with one breath blow slowly all that you can into the small tubing. The air will displace the water in the lower bottle, and the latter will be gradually forced upward into the upper bottle and the number of cubic inches noted on the measure will give you the amount of air that you can expel from your lungs.

In order to secure a perfect spirometer, all you need is

to invent some method that will enable you to measure the quantity of air that you expel. In making the second device here illustrated, provide yourself with two large tin cans that will hold from a gallon and a half to two gallons. One should be less in diameter than the other, and the narrow can should fit snugly within the other. Each can should be open at one end and closed at the other. At the closed end of the smaller should be a little opening with a thin spout. These cans or buckets can sometimes be bought at a hardware store, but any tinsmith will make them for a very small sum of money. If your lung capacity is large, the cans should be made to hold from a gallon and a half to two gallons. If small, cans of a gallon or a little more will be sufficiently large.

To complete your device, purchase two or three feet of small rubber tubing that will fit tightly over the spout. Now fill the larger can nearly full of water. Place the can with the spout to which the rubber tubing is attached, inside of the larger can, open end down, spout and tubing end up. You will then have a device such as appears in the illustration, which shows the lung tester ready for use. You can provide your spirometer with a measuring device in the following manner:

Procure some surgeon's adhesive tape, or some thick, smooth white cloth on which you can use a pen. Now paste this cloth or tape around a narrow piece of cardboard of nearly the entire length of the inside can. This cloth should be slightly longer than the smaller piece of cardboard around which it is pasted. The free end of this cloth should be fastened with glue, or in some other way tightly secured to the top of the can with the spout, as is shown in the illustration. You are thus provided with a measuring rule which will rise and fall with the can attached to the tube, as the air is blown in or escapes from the can.

Now, if you have no method of measuring the number of cubic inches contained in the inner can, you can arrange your measuring rule in the following manner: Place the can in which the nozzle or spout is fastened upside down on a table. Be care-

ful to let the nozzle extend over the edge of the table, stop it up,



An excellent type of lung tester.

then pour in water to the depth of about half an inch. Secure a quart measure that is absolutely accurate. Now place a long slip of stiff paper on the inside of the can containing the water, extending from the bottom to the top. Just at the top of the water make a mark on this paper with a lead pencil. Next carefully pour a quart of water into

the can. Then with a lead pencil, mark on the paper the exact point where the water comes after having poured in a full quart. There are, as said, 57.6 cubic inches in a quart of water. You will thus be able to place at this line the figures 57.6. Put in another quart and mark down twice 57.6, equaling 115.2, add still another and mark it three times 57.6, equalling 172.8. Continue until your can is very nearly full. Next take out your paper and transfer these data to your measuring rule.

CALISTHENICS.—(Gr. *kalos*, beautiful, and *sthenos*, strength.)—Calisthenics is the name applied to free movement exercises, without apparatus, frequently practiced in class drills. As one may gather from the derivation of the word, it originally had reference to exercises for promoting both gracefulness and strength. However, nearly all exercises make for beauty of body and gracefulness as well as strength, so that the word now has reference to all-round free movements. Calisthenics are well suited to the needs of the average man or woman, of moderate strength, and may be recommended to anyone for their constitutional benefit, though for

developing robust strength more vigorous exercise is desirable. (See *Class Drills*.)

CAMPING.—The subject of camping does not come strictly within the category of athletic sports or games, and yet it is such an important phase of outdoor life that it is not to be forgotten in the general discussion of topics of this nature. Camping is the ideal method of spending a vacation, for there is no means of recuperation from the wear and tear of business or professional life more effective or more enjoyable than getting out into the heart of Nature, among the trees, and alongside of some delightful lake or stream which offers the pleasures of boating and swimming. One seems, as it were, to get away from civilization and to get back to that simplicity and natural order of life in which the race has grown to its present stature, and in which has been developed that superb vitality which we have inherited, and without which we should have been able to endure the debilitating influences of our artificial, civilized life for but a very brief period at the best.

In the camp there is not only the outdoor sleeping and general open-air existence, but the opportunity and stimulus to all kinds of healthful and strength-building activities. One may climb trees, indulge in long walks and runs, play games, in addition to the boating and swimming. The value and benefit of camp life is attested by the fact that even the most conservative of mortals, those who have never given a moment's thought to the great general scheme of physical culture as we are teaching it, realize the value of camp life and are able to make a remarkable physical improvement in spite of the dietetic crimes and errors in which they persist during the entire period of camping.

If one cannot actually live in the country and as close to Nature as possible, all the year round, then at least he should try to spend his vacation in such a manner. Getting back into the primitive and roughing it for a while will do every one good.

CLASS DRILLS.—On the following pages are presented some very useful series of exercises intended to be of special value to clubs and schools where physical training is taken up in classes. Taken altogether, they offer a most comprehensive system of exercise for the general development of the entire body.

Class work in physical culture at the present time represents a very large proportion of the attention given to the subject throughout the whole world, and practically all schools and colleges now include a certain amount of such physical training in their courses. In many cases this is optional with the student, and in other schools it is compulsory. It should be compulsory in all schools, in order that any special defects may be overcome in childhood or youth, and that all graduates may be as sound physically as it is hoped that they will be mentally.

Outside of the schools there are many clubs and societies in which class work in physical training is taken up for the improvement of the entire body. In such cases the various drills which I am presenting will be of very great value, giving a splendid variety in exercise and stimulating interest to a high degree.

There is a certain pleasure and interest in working in company which one cannot experience when taking solitary exercise, and the privilege of working in a class, though not a necessity to one who is persistently determined to get health and strength, is nevertheless a great advantage in most cases. Different members can compare their improvement in certain intervals, and may also do a great deal in the way of encouraging each other.

There are a number of people who fail not only in the matter of physical improvement, but in many other phases of life through the lack of the quality now known, in the vernacular, as "stick-to-it-ive-ness," and who may tell you that once upon a time they started the practice of physical culture and kept it up for a few days, during which time it did them good, but that gradually they neglected it and the first thing

they knew they had dropped it entirely. Such an experience is usually the result of a lack of real interest in the beginning, and is truly unfortunate in view of the benefit that is lost. In many cases it is just those who lack the ambition to keep up the exercises, who are most sadly in need of them. If they could have continued long enough to get past a certain point, whereat they might have developed a certain amount of energy, they might have then enjoyed the exercise so much that nothing could persuade them from it. The interest of working in class with others is of great value in such cases. There are the specified hours at which the class meets, one is expected to be there, and being there, he goes through the exercise with pleasure, when if left to solitary initiative in his bedroom, he might neglect it altogether. It is very easy to excuse oneself on the plea of lack of time, no matter how much time is wasted every day.

Fortunately, most of those who become interested in physical culture and the betterment of their health shortly become so enthusiastic that there is no need of any special inducement to keep them at it. It is only the occasional one who easily gives it up, while with the others it becomes a fad, sometimes almost a passion. But in such cases, though the class work is not necessary, yet it so increases the joy of the thing that they eagerly grasp the opportunity of working with others.

If there is no opportunity for joining a class one can always take up these various exercise series for private practice at home. Very little space is required and any bedroom will supply the opportunity. But better still, after mastering all of these drills, it is a comparatively simple matter to organize a class or a little club in which a number can share the benefits, the student who has mastered these drills acting as instructor, and using this Encyclopedia as a reference and guide.

One thing is most important, and that is that the class room or hall, if the exercises are performed indoors, should be thoroughly ventilated. This means that the windows should be opened, not an inch or two, but all the way. Remember that when taking exercise a person consumes several times

more oxygen than in a state of rest or quiet. If a breeze blows through the room, it is better. The old objection to gymnasium work was that so few of them were properly ventilated and this objection still holds good in some cases. One of the oldest gymnasiums in New York City, up to a few years ago, was located in the basement instead of at the top of the building, and was practically without means of ventilation. The building is now torn down and such conditions are likely never again to be duplicated.

I am offering herewith some photographs of classes executing drills, illustrating the open formation necessary for such work. The instructor should always stand well apart and in front of the class, and if a small platform can be provided for this purpose so much the better, though it is not necessary for small classes.

A little marching drill is sometimes an advantage, and especially in large classes, as a means of getting pupils in position. Having marched around the gymnasium in single file, turning the corners square, let the class "Halt!" at command, across one side, turning on the near heel to face the instructor. To arrive at open formation from this point let class count in fours. Then at command to "March," let number "ones" remain stationary, number "twos" stop at two paces, number "threes" at four paces and number "fours" at six paces. If there is space and a more open formation is desired, the advancing files may stop at intervals of three or four paces, as stipulated. Another method of placing the class may be adopted, but this one is simple and convenient. The command might be "Open formation, two paces, March!" The class is then ready for the exercise drills.

Music adds greatly to the attractiveness of exercise in class, and wherever a piano is obtainable some arrangement should be made for suitable accompaniments for the drills. The expense, divided among a class, will be practically nothing, for a high-priced musician is not needed. An ordinary march, played in good time, will suffice.



LESSON ONE

General position: Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.



SIMPLE FREE MOVEMENTS

See description of movements on opposite page.



LESSON ONE.

EXERCISE No. 1.—Flex the arms rigidly, close hands tightly, strike vigorously straight in front, then return to original position. Count, 1-2.

EXERCISE No. 2.—Begin the same as above. Strike straight downward. Return to original position. Count, 1-2.

EXERCISE No. 3.—Begin the same as above. Strike straight upward. Return to original position. Count, 1-2.

EXERCISE No. 4.—Begin as previously described. Strike outward and backward as far as possible; then return to original position. Count, 1-2.

1st, 2nd, 3rd and 4th exercises are especially for developing the muscles of the upper arms—biceps and triceps.

EXERCISE No. 5.—Elbows rigid, arms down. Raise arms sidewise to level with shoulders. Return to original position. Count, 1-2. For the muscles of the lateral portions of the shoulders.

EXERCISE No. 6.—From sides, bring arms straight forward on level with shoulders; then return to original position. Keep elbows rigid. Count, 1-2. For muscles on anterior portions of shoulders.

EXERCISE No. 7.—With elbows rigid, bring arms from sides backward and upward as far as you can. Return to original position. Count, 1-2. For muscles of posterior portion of shoulders.

EXERCISE No. 8.—From the position with the arms held out from the body, elbows rigid, bring arms in front of the body as far as possible, crossing one over the other. Return to original position, and then repeat the exercise. Alternate the position in crossing the arms each time. Count, 1-2. For large muscles on front of chest.

EXERCISE No. 9.—With the arms held out from the body, elbows rigid, swing arms behind the body, crossing one over the other. Return to original position, and repeat, alternating the position of the arms at crossing of each exercise. Count, 1-2. For the muscles of the back, latissimus dorsi, immediately beneath the shoulder.

EXERCISE No. 10.—Bring the shoulders as far forward, then as far backward, as you can. Continue back and forth. Count, 1-2. For the muscles of the breast and the back between the shoulders.



LESSON ONE

General position: Body erect, shoulders back, eyes straight to the front, chin in, hands on the hips.



SIMPLE FREE MOVEMENTS

See description of movements on opposite page.



LESSON ONE—Continued.

EXERCISE NO. 11.—With hands on hips, knees rigid, bend the body far to the left, then far to the right. Count, 1-2. For the muscles at the sides on the waist line.

EXERCISE NO. 12.—With hands on hips, bend as far forward as you can, then as far backward as you can. Count, 1-2. For the muscles of the back and abdomen.

EXERCISE NO. 13.—With knees straight and immovable hips, twist the upper part of the body right and left. Count, 1-2-3-4. For the muscles at the waist line.

EXERCISE NO. 14.—Rise on the toes as high as you can. Return to original position. Count, 1-2. For the muscles on the back part of the calf.

EXERCISE NO. 15.—Raise toes off the floor, resting weight on the heels. Return to original position. Count, 1-2. For muscles at front of the calves.

EXERCISE NO. 16.—With hands on hips, back erect, bend knees and assume a crouching position. Back to original position. Count, 1-2. For the large muscles on the front part of the upper legs.



Class engaged in wand drill, instructor on small platform in foreground.



LESSON ONE

General position: Body erect, shoulders back, eyes straight to the front, chin in, hands on the hips.



SIMPLE FREE MOVEMENTS

See description of movements on opposite page.



LESSON ONE—*Continued.*

EXERCISE NO. 17.—Raise the left leg upward as high as you can, bending the knee. Return to original position. Same exercise with the right leg. Continue alternating from one to the other. Count, 1-2-3-4. For muscles of the extreme front part of the upper leg.

EXERCISE NO. 18.—With the knees rigid, bring the left leg outward to the side as far as possible. Return to original position. Same exercise with the right leg. Return to original position. Count, 1-2-3-4. For the muscles on the outside of the extreme upper part of the legs.

EXERCISE NO. 19.—With knees rigid, bring the left leg over in front of the right leg as far as possible. Return to original position. Same exercise with the right leg. Return to original position. Count, 1-2-3-4. For the muscles on the inside of the extreme upper leg.

EXERCISE NO. 20.—Knees rigid. Raise the right leg upward and backward as far as you can. Return to original position. Same exercise with left leg. Return to original position. Count, 1-2-3-4. For the muscles on the upper part of the back portions of the legs and hips.

EXERCISE NO. 21.—With the knees rigid, raise the left leg upward and forward as far as you can. Return to original position. Same exercise with the right leg. Count, 1-2-3-4. For the muscles on the front part of the extreme upper leg.

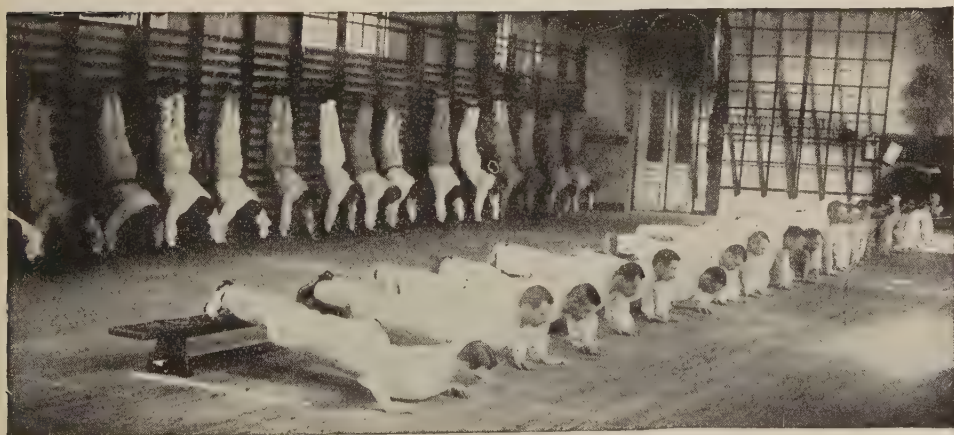


Photo Paul Thompson, N. Y.

Swedish army men at work in the gymnasium.



LESSON TWO

General position: Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.



ADVANCED FREE MOVEMENTS

See description of movements on opposite page.



LESSON TWO.

EXERCISE No. 1.—Bring arms forward and high over head with elbows rigid. Step far forward with the left foot as arms go upward. Return to original position. Repeat; stepping forward with right leg. Repeat entire exercise. Count, 1-2-3-4.

EXERCISE No. 2.—With elbows rigid, bring arms outward to the sides, then high over head, slapping palms together. As arms go upward, step far out (not forward as shown) with the left foot. Alternate with left and right legs. Count, 1-2-3-4.

EXERCISE No. 3.—With left foot drawn forward (sparring position), strike as far out as you can with the left arm. Return; then strike far out with right arm. Alternate from one to the other. Count, 1-2.

EXERCISE No. 4.—Raise shoulders as high as possible, at the same time rising high on the toes. Count, 1-2.

EXERCISE No. 5.—With arms flexed, fingers resting on shoulders, bend forward and touch the fingers of the left hand near the left heel, at the same time striking upward with the right hand. Return to original position. Repeat exercise at opposite side. Count, 1-2-3-4.





LESSON TWO

General position: Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.



ADVANCED FREE MOVEMENTS

See description of movements on opposite page.



LESSON TWO—*Continued.*

EXERCISE NO. 6.—With feet spread far apart, hands on hips, bend downward and reach out and touch the floor as far as you can reach to the left. Return and repeat this exercise to the right. Count, 1-2-3-4.

EXERCISE NO. 7.—Begin with arms flexed; strike upward with left hand, bringing up left leg at the same time. Return. Alternate. Count, 1-2-3-4.

EXERCISE NO. 8.—Touch the toes with the fingers, keeping the knees as nearly straight as possible, then with one swing bring the arms high over head, reaching as far back as you possibly can. Count, 1-2.

EXERCISE NO. 9.—With the arms flexed over shoulders, swing body (from the hips upward) far to the right, then back, far to the left, then back, and repeat. Count, 1-2-3-4.

EXERCISE NO. 10.—Begin arms flexed and fists tightly clenched. Bend the knees as much as possible, striking straight upward as body descends. Return to original position. Count, 1-2.



A class exercising on the lawn. Various exercise drills are given each day, and the exercises are given with a view of making them pleasurable as well as beneficial.



LESSON TWO—*Continued.*

EXERCISE NO. 11.—Raise right arm with elbow rigid out to the side and high over head, bending far over to the left as the arm goes upward. Same exercise with the left arm. Alternate from right to left. Count, 1-2-3-4.

EXERCISE NO. 12.—Hold arms high over head. With elbows rigid, palms together, bring them downward and far backward vigorously. Return. Count, 1-2.

EXERCISE NO. 13.—With feet far apart, hands on hips, bend the left knee, keep right knee straight, bend body over towards the left. Return. Alternate. Count, 1-2-3-4.

EXERCISE NO. 14.—Starting with arms on level with shoulders in front of body, elbows rigid, palms together, swing the right arm obliquely downward and backward, and the left arm obliquely upward and forward. Return and alternate. Count, 1-2-3-4.

EXERCISE NO. 15.—Bring left leg upward with knee bent, and bring the head far back at the same time. Return. Alternate. Count, 1-2-3-4.

EXERCISE NO. 16.—Jump slightly and transfer the weight of the body from right to left foot. Continue, swinging arms, elbows rigid, at same time.

LESSON THREE.

Consisting Chiefly of Floor Calisthenics.

Complete Illustrations, Exercises 1 to 12 appear on pages 652 and 653

General Position.—Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.

EXERCISE No. 1.—Bend knees, assume a crouching position, retain this position and swing arms high over head, elbows rigid, touching palms together. Repeat. Count, 1-2.

EXERCISE No. 2.—Crouching position. Hold arms forward, elbows rigid, on level with shoulders, palms together. Swing arms vigorously out to the side. Return. Repeat. Count, 1-2.

EXERCISE No. 3.—From a crouching position, place the hands on the floor as far back as you can reach. Bring the feet far forward sitting on the floor. Now raise the body as high as you can, resting the weight on the heels and palms. Return. Count, 1-2.

EXERCISE No. 4.—From a crouching position, place the hands on the floor, shoot the feet out backward, the weight on palms and toes, body rigid. Now bend the body allowing the hips to rest on the floor, now raise body as high as you can. Repeat. Count, 1-2.

EXERCISE No. 5.—Standing erect, swing arms forward, then high over head, reaching up as high as you can at the same time rising on toes. Count, 1-2.

EXERCISE No. 6.—With hands on hips, step far forward with the right foot, bending the right knee. Return. Same with the left foot. Count, 1-2-3-4.

EXERCISE No. 7.—From a crouching position, with arms tightly flexed, strike upward reaching as high as you can, straightening the legs and rising at the same time.

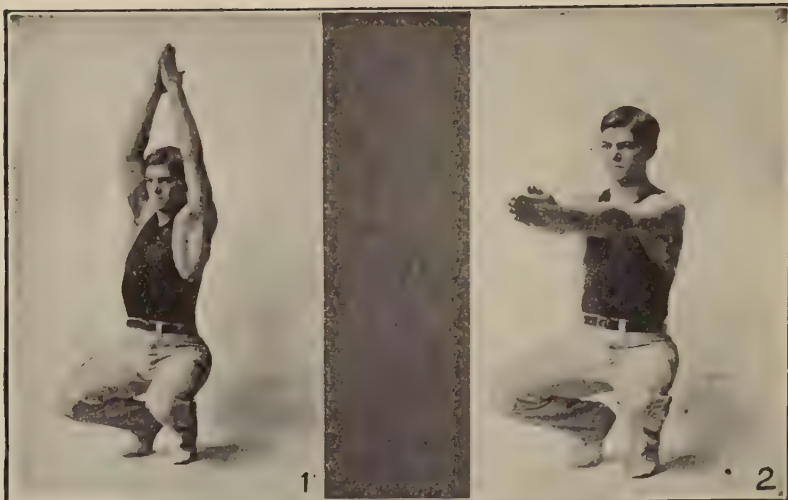
EXERCISE No. 8.—From a crouching position, place the hands on the floor, and shoot the legs out to the right side, resting the weight of the body on the palms of the hands and left side of left foot. Let the hips touch the floor, then raise the central portion of the body as high as you can. Return. Repeat. Count, 1-2.

EXERCISE No. 9.—Same exercise as preceding. Resting weight on the palms of the hands and the right side of the right foot. Return. Count, 1-2.

EXERCISE No. 10.—Rest weight of body on the toes and palms of hands, face downward, body rigid, raise right leg as high as you can. Return. Same exercise with left leg. Count, 1-2-3-4.

EXERCISE No. 11.—Assuming same position as preceding exercise, bring right leg far out to the right. Return. Same with the left leg. Count, 1-2-3-4.

EXERCISE No. 12.—Assume position described in preceding exercise, jump off the floor with the strength of the arms. Count, 1.



LESSON THREE

General
position:
Body erect,
shoulders
back, eyes
to front,
chin in, arms
at sides

CONSISTING
OF FLOOR
CALIS-
THENICS

*See de-
scription on
page 651*

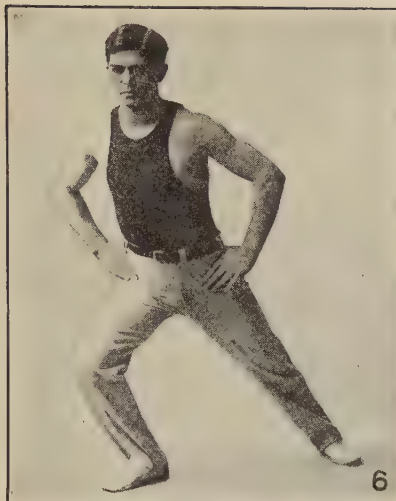


3



4

5



LESSON THREE

General
position:

Body erect,
shoulders
back, eyes
straight to
the front,
chin in, arms
hanging at
sides



8-9

CONSISTING
OF FLOOR
CALIS-
THENICS

*See de-
scription on
page 651*



10



11-12



LESSON THREE—*Continued.*

EXERCISE No. 13.—With arms straight out to the side, on level with shoulders, move the arms in small circles. Count, 1.

EXERCISE No. 14.—Assume position, weight on toes and palms, face downward, body rigid, move the right hand from the floor and swing it as high outward to the side as you can. Same with the left hand. Count, 1-2-3-4.

EXERCISE No. 15.—While resting with the weight, face downward, on hands and toes, body rigid, slowly bring hands outward to the sides as far as you can.

EXERCISE No. 16.—Assume same position as above, slowly bring hands as far forward as you can, elbows and body rigid.

EXERCISE No. 17.—From erect position, crouch to the floor, bending knees and assuming a crouching position. Place hands on floor and shoot legs behind, resting weight on palms and toes, now with the body rigid, bend arms and touch chest to the floor. Bring legs up to crouching position. Rise to erect position. Count, 1-2-3-4-5-6.



LESSON FOUR.

Consisting of Athletic Calisthenics.

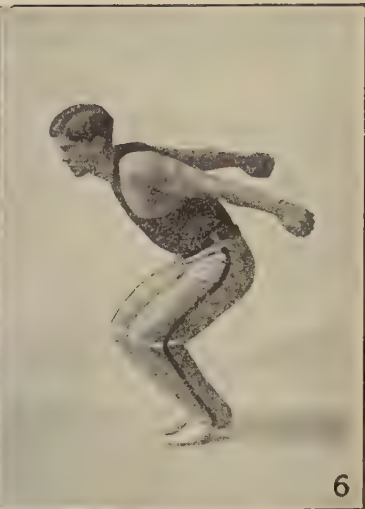
General Position.—Body erect shoulders back, eyes straight to the front, chin in, arms hanging at sides.

EXERCISE NO. 1.—*Putting the Shot.*—Assume the general position taken in this exercise. In the action of throwing the shot reach out as far as you can. Take the exercise throwing with the right hand and with the left. Count, 1-2.

EXERCISE NO. 2.—*Throwing the Hammer.*—Clasp hands together in front; swing arms around twice and then throw over the left shoulder as though you were throwing the hammer. For drill purposes this exercise will be better if the arms are swung in a circle, first swinging to the right and then to the left. Count 1 for each circle.

EXERCISE NO. 3.—*High Jumping.*—Jump moderately in the beginning, gradually increasing to high, until jumping as high as you can. Count, 1.

EXERCISE NO. 4.—*Bowling.*—Assume position as in bowling. From far back bring the hand far forward, just as if throwing the ball down the bowling alley. Same exercise with position reversed. Count, 1-2.



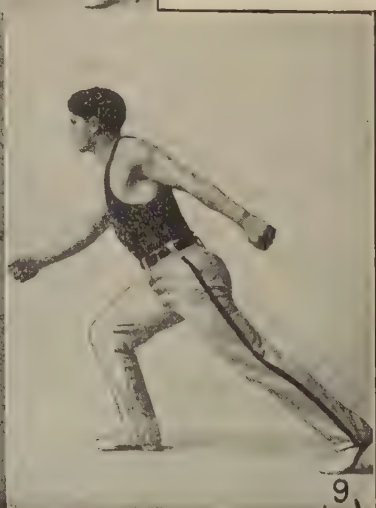
LESSON FOUR

General position: Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.



CONSISTING OF
CALISTHENICS

*For Description
see page
657*



LESSON FOUR—*Continued.*

EXERCISE No. 5.—*Lawn Tennis.*—With an imaginary racket in the right hand strike a low ball, then a medium and then a high ball. Same exercise with the left hand. Count, 1-2-3.

EXERCISE No. 6.—*Distance Jumping.*—With hands on hips jump about one or two feet forward and then backward. Count, 1.

EXERCISE No. 7.—*Ball Throwing.*—With an imaginary ball in right hand throw underhanded; then out from the side and from overhead. Same exercise with the left hand. Count, 1-2-3.

EXERCISE No. 8.—*Golf.*—With an imaginary golf stick in hand swing arm upward and backward, and then strike at an imaginary ball on the ground. Count, 1-2.

EXERCISE No. 9.—*Running.*—Shift weight from one foot to the other, bringing right and left leg up as high as you can each time weight is shifted. Count, 1-2.

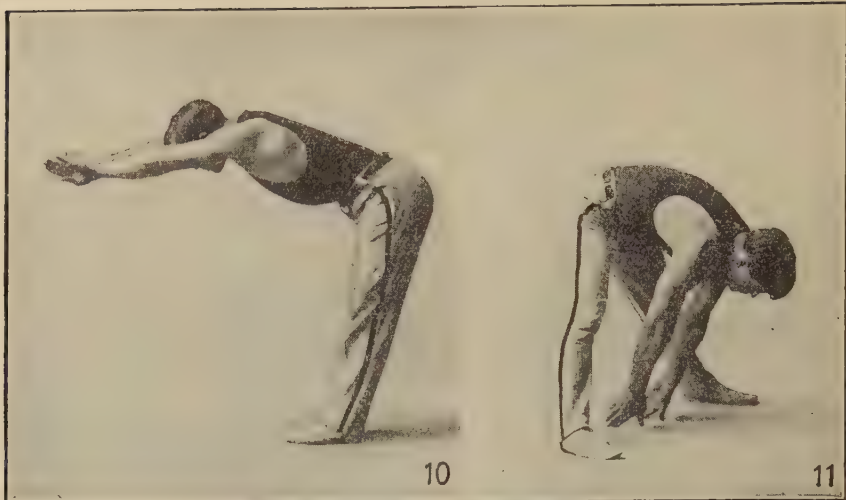
EXERCISE No. 10.—*Swimming.*—Bend far forward until upper body is nearly in a horizontal position. Now shoot hands out forward and bring them out to the sides as in swimming. Count, 1-2.

EXERCISE No. 11.—*Throwing Football.*—Take up an imaginary ball from between feet and make a motion as though throwing it back of you overhead. Count, 1-2.

EXERCISE No. 12.—*Hopping.*—With all the weight on the right foot jump as in skipping a rope. Same exercise with the left foot. Count, 1.

EXERCISE No. 13.—*Sparring.*—Assume sparring position, with left foot forward and body well braced. Strike out with the left and right hands alternately, reaching out as far as possible. Count, 1-2.

EXERCISE No. 14.—*Throwing the Discus.*—Assume the usual position as taken in this exercise. With an imaginary discus in the right hand throw it forward in the usual way, but without the turn used by athletes. Same exercise with the position reversed. Count, 1-2.



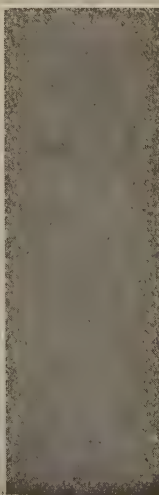
LESSON FOUR

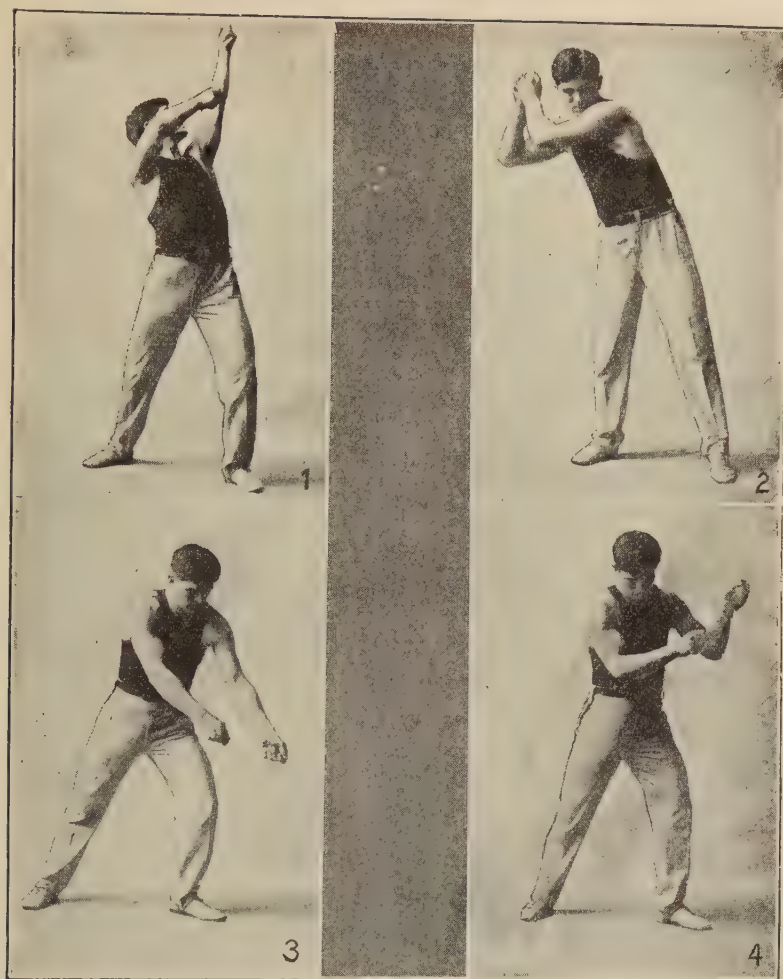
General position: Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.



CONSISTING OF
CALISTHENICS

*For Description
See Page 657*





LESSON FIVE.

Calisthenics Embodying Same Motions as Farm Work.

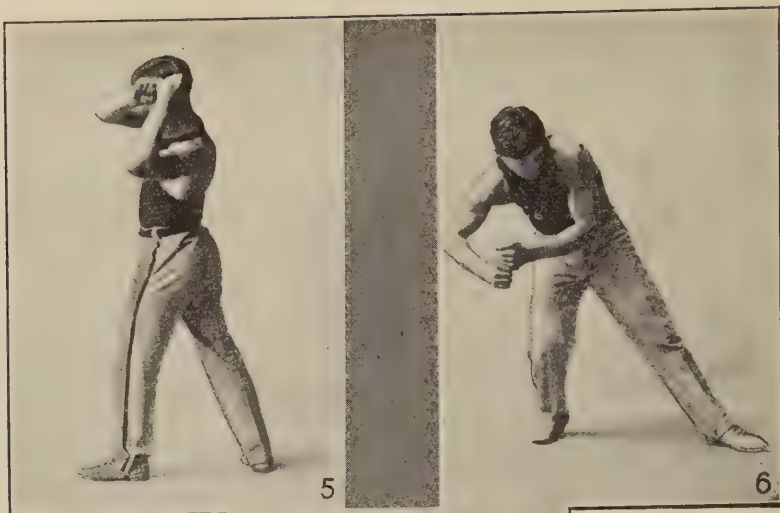
General position.—Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.

EXERCISE No. 1.—*Pitching Hay*.—Assume appropriate position, with left foot forward. Thrust hands downward as when using pitch-fork. Swing arms up over left shoulder, rising on toes. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 2.—*Chopping Wood*.—Take grip of imaginary axe, right hand in front of left. Place left foot forward, twist body to right side, and swing arms upward and backward, then downward and forward. Count, 1-2.

EXERCISE No. 3.—*Raking*.—Place left foot forward, bring both hands to right side, left hand in front of right. Lean forward, bending at waist, and straightening arms, then pull backward, bending both arms on right side of chest, also the back, resting weight upon rear leg. Count, 1-2.

EXERCISE No. 4.—*Hoeing*.—Place left foot forward, bend body forward from hips, left hand in front of right, raise imaginary hoe about one foot from the earth and bring down forcibly. Same exercise with position reversed. Count, 1-2.



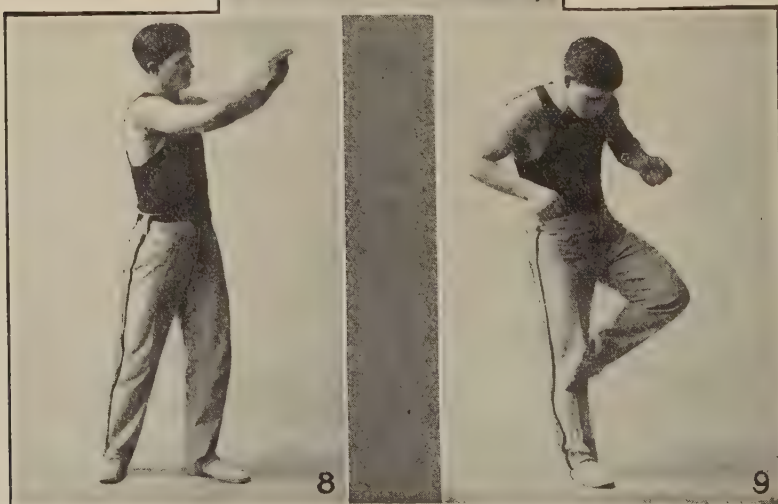
LESSON FIVE

General position: Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.



FARM CALISTHENICS

For description see page 661



LESSON FIVE—*Continued.*

For Complete Illustrations, See pages 660 and 662

EXERCISE No. 5.—*Swinging the Maul.*—Assume position as in chopping wood. Bring arms upward and backward in a long, sweeping circle and down forward, swinging hard on downward movement. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 6.—*Sawing with Cross-Cut Saw.*—Place left foot forward, rest weight on right leg, bend body forward and grasp imaginary saw handle, push and pull as far as possible in each direction. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 7.—*Turning Soil with Garden Fork.*—Place left foot forward and grasp imaginary fork. Thrust forcibly as if far into the soil, lifting, turning over and throwing imaginary soil forcibly to the earth as in breaking lumps. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 8.—*Currying and Brushing a Horse.*—Grasp an imaginary curry-comb in the left hand, and a brush in the right, bending the arms at the elbows, raise hands in front of chest and bring comb downward, following with brush. Count, 1-2.

EXERCISE No. 9.—*Using Buck Saw.*—Place left knee on an imaginary log, grasp saw with the left hand beside upper chest and work upward and downward. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 10.—*Sowing Wheat.*—From an imaginary sack filled with wheat hanging at left side, take out a handful of imaginary wheat and extend arm sidewise, using a circular, forward movement of right arm to left side. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 11.—*Picking up Potatoes.*—With an imaginary basket on left arm, take a full knee bend, picking up potatoes with right hand. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 12.—*Swinging Scythe.*—Extend right and left arms obliquely sidewise and downward, grasping an imaginary scythe, spread feet, twist body to right and swing with straight arms in a circle. Same exercise with position reversed. Count, 1-2.

EXERCISE No. 13.—*Milking a Cow.*—Assume squatting position, grasping teats with left and right hands, squeeze alternately, beginning with forefinger and thumb of each hand. Count, 1-2.

EXERCISE No. 14.—*Chasing Chickens.*—Act as if running, but without moving from station, and swing arms in all directions. Count, 1-2.



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LESSON FIVE

General position: Body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.



12

FARM CALISTHENICS

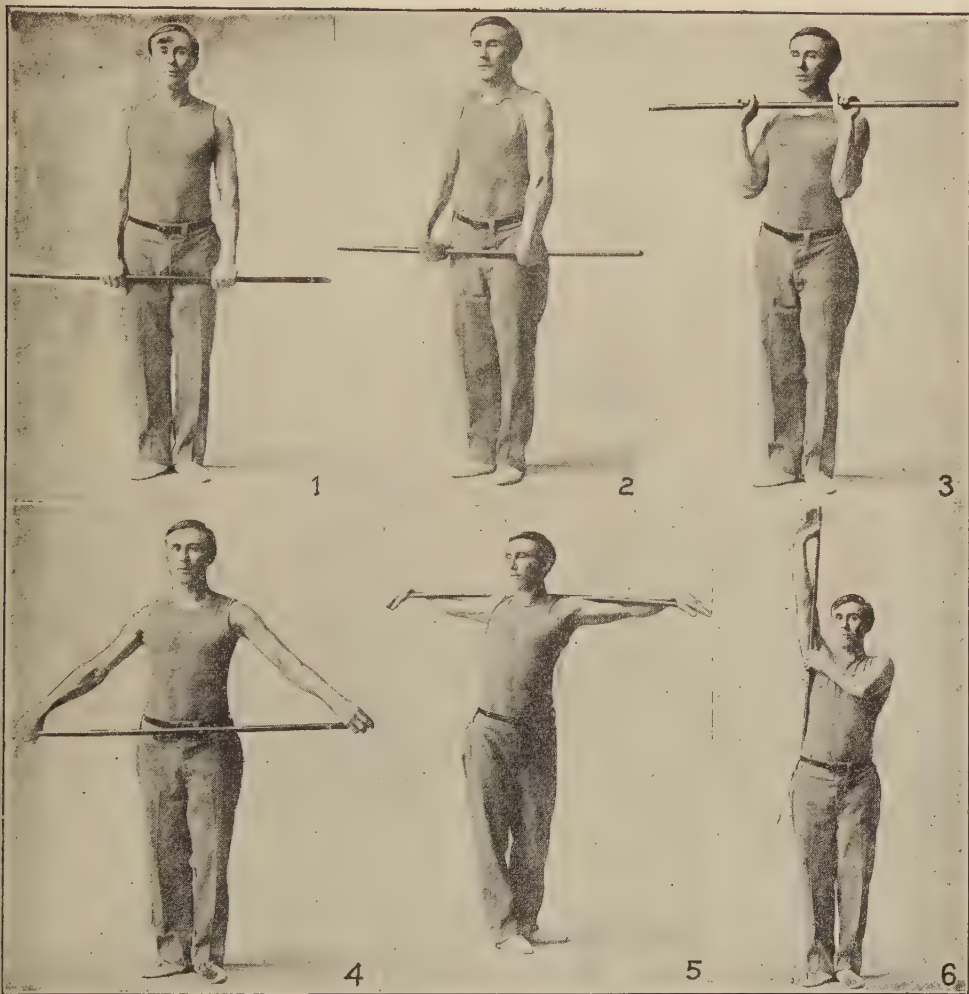
For description see page 661



13



14



WAND DRILL.

No. 1.—Position of Attention, from which most moves begin.

No. 2.—Flex the hands on wrist in two counts, from position, front horizontal and vertical.

No. 3.—*a.* Flex the forearm on chest and return in two counts.

b. Flex forearms first count, extend front horizontal second count, flex forearm third count and position fourth count.

c. Flex forearms first count, extend vertical second count, flex forearms third count and position fourth count.

WAND DRILL—*Continued.*

d. Flex forearms first count, extend vertical second count, bend down and touch floor without bending knees third count, vertical position fourth count, flex forearms fifth count, position sixth count.

No. 4.—Grasp wand on ends.

a. Bring the wand overhead to small of back, first count, position second count.

b. Right hand over head first count, small of back second count, left hand over head third count and position fourth count.

No. 5.—Wand placed on back of neck, arms wound over wand.

a. Bend left and right side in two counts.

b. Rotate left and right in two counts (as illustrated).

c. Bend forward and backward in two counts.

d. Rotate left first count, bend forward second count, straighten third count, rotate to front fourth count. *Alternate.*

e. Bend forward first count, rotate left second count, back to first position third count and position fourth count.

No. 6.—*a.* Right arm vertical, left hand to right shoulder as per illustration first count, position second count. *Alternate.*

b. Position as per illustration first count, bend left second count, straighten third count, position fourth count. *Alternate left.*

c. Charge forward right from position six first count, bend to left side second count, straight third count, position fourth count. *Alternate.*

No. 7.—*a.* Right arm front horizontal, left hand on right shoulder, as per illustration, in two counts. *Alternate left.*

b. Position illustrated first count, rotate half turn, right, second count, front third count and position fourth count. *Alternate left.*

c. Charge forward, left, position of wand as per No. seven, first count; rotate half turn second count, front third count and position fourth count. *Alternate.*

No. 8.—*a.* Position illustrated in No. seven first count, position illustrated in No. eight second count, first position third count and position fourth count. *Alternate, left.*

b. Charge forward right from position illustrated in No. seven first count, backward bend with wand in position illustrated in No. eight second count, charge position third count and position fourth. *Alternate, left.*



WAND DRILL—*Continued.*

No. 9.—a. Right arm side horizontal, left hand at back of head as per illustration, first count; position as in No. one second. Alternate, left.

b. Charge sideward right, wand as illustrated in No. nine, first count; bend right second count, straight third count, position fourth count. Alternate, left.

c. Charge forward right, wand as per illustration in No. nine, first count; bend forward second count, straight third count, position fourth. Alternate, left.

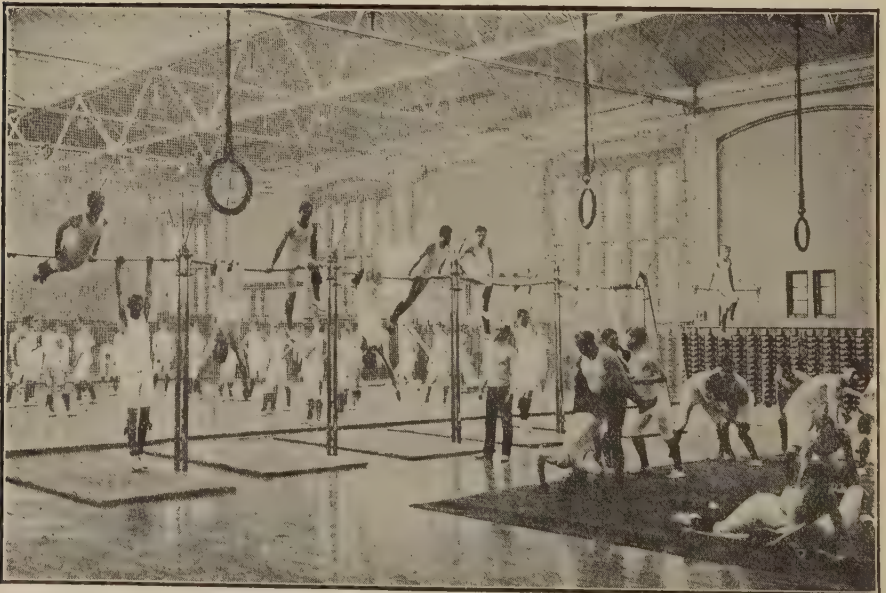
No. 10.—Charge sideward right, flex the arms first count, thrust right arm side horizontal, left hand to shoulder, second count; flex arms on chest third count, position fourth count. Alternate, left.

WAND DRILL—*Continued.*

a. Flex arms on chest as per illustration No. three, first count; charge sideward right, thrust right arm side horizontal and left hand to shoulder, as in illustration No. 10, second count; recover charge and flex arms to chest third count, position fourth.

No. 11.—Charge right, left arm obliquely downward, right hand to left shoulder, first count; position second count. Alternate, left.

No. 12.—Stride stand, legs straight, wand front horizontal, first count; right end of wand between thighs, left end forward as per illustration, second count; wand to first position third count and position fourth. Alternate, left.



Showing various "Squads" engaged in different forms of exercise in a large modern gymnasium.



DUMB-BELL DRILL.

No. 1.—Position of Attention.

No. 2.—Flex hand on wrist in two counts, from position with arms at side of body or front horizontal, side horizontal and vertical.

No. 3.—Bend the hands side to side in two counts. From position, front horizontal, side horizontal and vertical.

No. 5.—From position illustrated large outward circles, and large inward circles and large parallel circles left and right in two counts.

No. 4.—Rotate arms inward and outward, from position, the front horizontal, side horizontal and vertical in two counts.

No. 6.—Flex arms on chest in two counts, then front horizontal and side horizontal.



DUMB-BELL DRILL—*Continued.*

No. 7.—From vertical position as shown in No. five, to rear as shown in No. seven in two counts.

No. 8.—Curl the arms in two counts.

No. 9.—Exercise for lifting the chest, count eight while inhaling and eight during exhalation.

No. 10.—Shoulder shrug forward and backward in two counts.

No. 11.—Shoulder shrug up and down in two counts.

No. 12.—Hips firm, head forward and backward, bend in two counts.



DUMB-BELL DRILL—Continued.

No. 13.—Hips firm, head sideward left and right, bend in two counts.

No. 14.—Hips firm, head left and right rotate in two counts.

No. 15.—Hips firm, rise on balls of feet in two counts.

No. 16.—Hips firm, raise balls of feet in two counts.

No. 17.—Hips firm, toes inward and outward in two counts.

No. 18.—Hips firm, heels inward and outward in two counts.



DUMB-BELL DRILL—*Continued.*

No. 19.—Hips firm, ankles inward and outward in two counts.

No. 20.—Hips firm, half knee bend in two counts.

No. 21.—Arms side horizontal, full knee bend in two counts.

No. 22.—Left arm and left leg flex in two counts. (Alternate right.)

No. 23.—Left arm and left leg and thigh flexed in two counts (Alternate right.)

No. 24.—Left arm front horizontal, left thigh flexed, leg and foot extended in two counts. (Alternate right.)

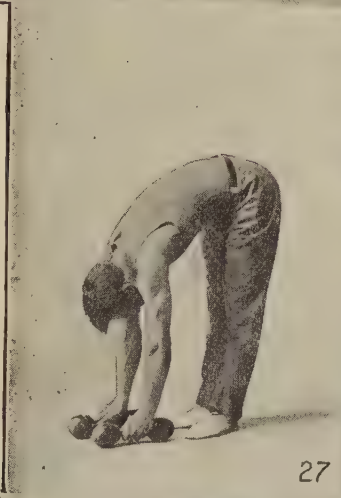


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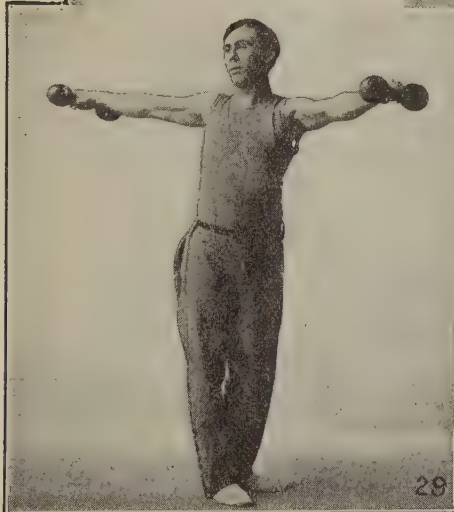


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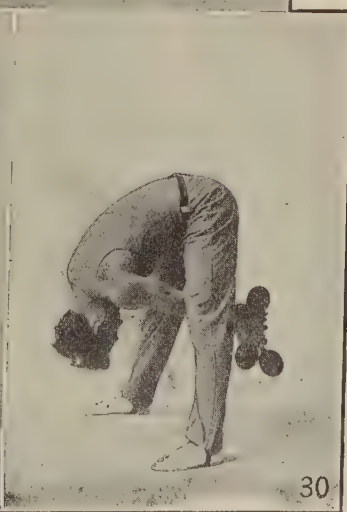


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30

No. 25.—Left arm side horizontal and left thigh abducted, leg and foot extended in two counts. (Alternate right.)

No. 26.—Right arm and right leg extended to the rear in two counts. (Alternate left.)

No. 27.—From position 5, to position 27 as illustrated in two counts.

No. 28.—From position 5, to position 28 as illustrated in two counts.

No. 29.—From position rotate left and right in two counts.

No. 30.—Stride stand, arms from position five, bells clasped above head, swing between thighs in two counts.

INDIAN CLUB DRILLS.

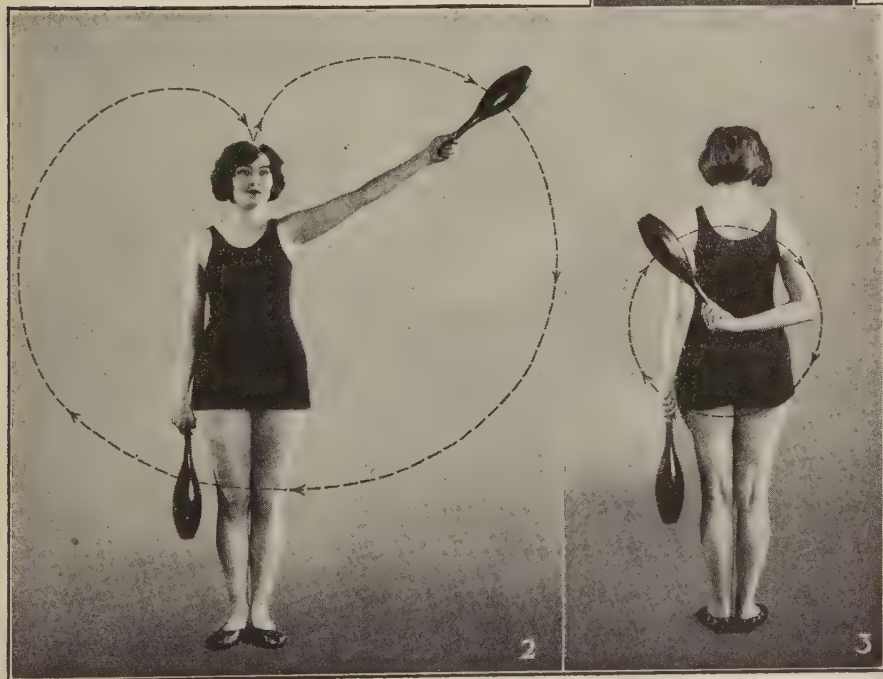
Indian clubs, as will be seen by the illustrations, are bottle-shaped clubs of wood. Drills with them form part of the gymnastic work of schools of physical education, of some gymnasiums, and of some athletic clubs. The weights run from one-half pound to four or five pounds; ordinarily however, over one-pound clubs are used in most class work.

Indian clubs provide excellent exercise for the hands, wrists and forearms particularly; but when done with vigor, especially the various full-arm swings, the shoulder, chest and upper back muscles are brought into action very beneficially. Various combinations of full-arm and wrist movements are possible, the clubs being swung in the same or opposite directions, or one club in a full-arm swing while the other is swung in one or several wrist circles.

EXERCISE 1.—General position: Body erect, heels together, elbows at sides with clubs held in a vertical position in front of shoulders. This position, shown in illustration, is assumed at the beginning of all movements, and the erect position is held during all swings. In some movements, however, the body is rotated to one side or the other, but the trunk is never bent from the vertical except in some exhibition movements. If the swings and grace of movements are to be perfected there can be no stiffness of the body.

EXERCISE 2.—This is a full-arm swing. From position the club is sent slightly upward and outward to the side, the arm when fully extended being in oblique line upward as illustrated. Then without stopping continue downward, across the front, then upward in the direction of arrows, to a point slightly more to left of head than shown in photo, around to the starting point. As the diagram of illustration shows, the completed movement describes an irregular heart-shaped circle. Continue movement until slightly tired, and then repeat with other arm, then reverse swing.

EXERCISE 3.—Place hand back of you at waistline and describe a circle with wrist movement. See illustration five. This exercise is valuable for rendering wrist strong and supple. The direction of swing may be right or left. This movement combines easily with the full-arm swing. After the club has swung inward across the body, and the hand reaches the right hip in front, pass it to the rear and perform the circle shown; then sweep down and out to a full-arm swing, and continue. Reverse both large and small circles.



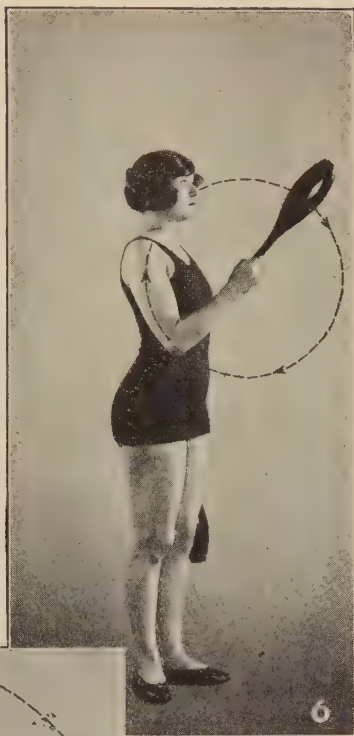


EXERCISE 4.—This exercise is very similar to Exercise 2, except that instead of returning to position to complete the heart, another and smaller circle is described *back* of the shoulder (instead of in front of shoulder as diagram may seem to indicate). This is a combination movement, which besides exercising muscles of shoulder and upper arm, as does the first, also exercises those of the forearm and hand. This also is to be done, first with one arm, then with the other, also reverse. Continue movement until slightly tired, and then repeat with other arm.

EXERCISE 5.—In this exercise, the procedure in part is the same as for the first. A large, continuous sweeping circle is described with both clubs, one arm following the other, round and round, again and again without cessation until slightly fatigued. Swing first to the right, when having done the movement as often as desired, change the direction of the swing to the left.



EXERCISE 6.—Starting at position, turn on the ball of the right foot and heel of the left foot to side position, but retain position on ball of right foot, left foot resting normally. While turning perform wrist circle outward. This may be combined with large side circle after the turn; and the wrist circles may be outward and inward. Both clubs may be used later, swinging together or in opposite directions, or one in a large circle, the other in a small circle.



EXERCISE 7.—

The full-arm swings are as shown in either Exercise 1 or 3, or both clubs may be swung inward across the body in full circles, or as the reverse of Exercise 1. The wrist circles may be done in front of the hips or to the rear (as in Exercise 4), or to the rear of the shoulders (as in Exercise 2); or in small wrist circles overhead.

CONCENTRATION.—An important element of success in exercise lies in concentrating the mind upon the work in hand. This is so obvious that it hardly seems to require saying, for anyone must realize, if he stops to think about it at all, that one cannot expect to get much benefit out of his exercise if he is meanwhile thinking about the latest improvements upon internal combustion engines, his brother-in-law's new hat or what he would like to have for dinner next Fourth of July. The mind should be upon the exercise every moment of the time devoted to it, and more than this, should be centered locally upon the particular muscle or muscles involved in the exercise.

In some forms of exercises, the *Tensing* and *Resistance* exercises, everything depends upon the application of the mind to the muscles involved, and one can make them as powerful as he chooses according to the degree of nerve-force or mental energy expended in them. As pointed out in my remarks on *Tensing*, however, this form of exercise is not the most satisfactory for purposes of mental concentration, because the energy of the mind is divided between the two opposing muscles or sets of muscles. There is better opportunity for the concentration of the mind upon the muscles, where it is devoted to a single muscle or set of muscles acting against some external resistance, or perhaps that afforded by the weight of the body itself. The natural function of a muscle is the movement of the member to which it is attached at its point of "insertion," or the movement of any external object with which that member has to do. If there is sufficient real resistance, this situation offers the very best opportunity for the exercise of mental concentration.

One should enter into his exercise with energy and spirit, and when he executes a movement he should do it thoroughly. As soon as he reaches a point where he cannot concentrate his mind, and where his efforts are careless or lackadaisical, he had better stop. When I say that exercises should be executed with energy I do not mean that they should be performed with

a jerk, for this is as undesirable in many cases as executing them with a swing. Rather should they be executed with a steadiness that insures the normal operation of the muscle throughout the entire movement.

While speaking of the necessity for mental concentration, I might as well refer briefly to a phase of the relation of the body and mind that is not very clear to a great many people. I have heard the opinion expressed, sometimes by those who might be expected to know better, that the development of either the mind or the body must necessarily be at the expense of the other, so that if one devoted himself assiduously to physical training his mental powers would deteriorate as though to compensate for his acquisition of brawn! Nothing, surely, could be more absurd than such a notion. The mental qualities of the individual primarily depend upon the gifts of his inheritance, after which everything will depend upon the education or, as we would better say, the development of his powers. The power to think comes with the practice of thinking, or the exercise of the power, and this is largely independent of the matter of muscular development, so far as the health is such that the brain may be properly nourished. Even the greatest excess of muscular development could not detract from one's natural intelligence or the development of his brain, if he cultivates his mental powers. I have known athletes of tremendous physical energy who were also exceptionally alert and gifted mentally. And I have known others of great physical strength who were not what one would call exceptionally bright, but the development of muscular strength was no hindrance in any case. The minds of the latter would probably have been even less brilliant if they had neglected their bodies and had degenerated into physical weaklings, because in this case they would have missed the element of mental training which is found in the training and use of all parts of the body. The mental possibilities of the individual really depend upon what is born in him, his temperament or inheritance, as it were, and physical training, far from impeding the develop-

ment of the mind, is always a tremendous help in this direction. In early infancy, the first and entire training of the mind comes through the use of the muscles and through the muscles of the various members of the body.

CONSTITUTIONAL EXERCISES.—The term “constitutional” may be applied to a certain class of exercises which are of special or peculiar value for building health and general constitutional vigor, as distinguished from other forms of muscular exercise which are noteworthy for accomplishing a splendid development and a condition of powerful strength in the muscles. It should be said that practically all exercises are constitutional in their effects, influencing the circulation and the tone of the functional system and serving to improve and maintain the health, and the distinction made here may seem a bit fanciful in some cases. And yet the term is justified in its application to some forms of exercise which would never bring about the development of an athlete, but which keep the blood in active and prolonged circulation, induce free breathing, stimulate the functional and depurating organs and in other ways serve to develop vitality and nervous energy. They may be regarded as purely health-building exercises, as distinguished from strength-building exercises, though it must never be forgotten that strength-building activities are also health-building, and absolutely essential to a complete scheme of body culture.

The subject of walking will first of all occur to anyone as a most satisfactory form of constitutional exercise, and I would refer to the discussion of walking in another chapter. It is one essential that no one can afford to overlook. Under this classification also might be included many forms of exercise in the open air, and especially those which are not of a violent or strenuous character and which require vigorous athletic strength and training. Among these are golf, horseback riding, cycling (in moderation, not racing), mountain climbing, canoeing, rowing (for pleasure and not as a form of competitive athletics), skating, snow-shoeing and other ac-

tivities of a like nature. Even farm-work and gardening may properly be included under this head.

No matter what one may select in the way of special strength-building exercises, it is most important that he should also adopt some form of milder constitutional exercise to be carried out preferably at some other time of day. There are some occupations involving active muscular effort throughout the day which will take the place of this constitutional exercise, and in such cases it will be necessary to take the special systematic exercises only. But in the vast majority of instances, which means, in other words, all cases in which the occupation is sedentary, and also many of those into which some form of manual labor enters, a certain part of the day should be set aside for this constitutional exercise. Walking is highly recommended for this purpose, but one may substitute some of the other open-air pastimes named for at least a part of the time.

There are some forms of vigorous strength-building exercises which are so energetic that only a few minutes devoted to them will be sufficient. The strength and development of a muscle, as we have noted in another place, depends not so much upon the number of times it is employed as upon the degree of resistance offered to it and the energy and power with which it contracts in overcoming that resistance. And while in some cases fifteen minutes daily will be found sufficient to devote to such strenuous exercises for development, and while these very exercises will be advantageous from a constitutional standpoint, yet this small amount of time out of twenty-four hours is not enough to accomplish all of the physiological results which we desire to bring about through physical activity. Even this much time given in this way will mean far better health than would be possible with no exercise at all, but for the most perfect physical condition one should endeavor to see that his physical activity and his life in the open air is a matter of hours rather than of minutes, and he should try to spend at least two or three hours in this way.

The essential advantages of exercise from the standpoint of

health are to be found in the rebuilding of tissues and cells, the increased circulation required for this purpose, the free breathing and thorough oxygenation of the blood, and the effect of all these upon the elimination of accumulated wastes and upon the activity and tone of the various functional and vital organs. For these reasons some moderate form of exercise which will keep the circulation active and vigorous for a long time will be more effective than violent exercise continued for a short time, though this is saying nothing against really strenuous or violent exercise for those who are strong and fit for it. But the average man seeking health cannot continue the most energetic effort for two or three hours without consuming too much nervous energy and producing a condition of depletion and collapse which leaves him worse off than before. Walking, for instance, would be just the thing for him, in the way of constitutional exercise, to be supplemented at some other time of day by a shorter period of exercise with special movements for development and strength-building, with perhaps some movements of a corrective nature to overcome any defects or peculiar weaknesses.

I would recommend for constitutional purposes any open-air exercise which involves the moderate use of all of the muscles of the body or of the larger and more important ones, without placing undue strain upon any. The most powerful contraction of the muscles of the forearm and hand will not have so much effect upon the heart and the circulation generally as the moderate use of the large muscles of the legs. Furthermore, in the latter case there will be less expenditure of nervous energy.

In connection with the subject of constitutional exercise I would refer the reader to further discussion of the subject in this and following volumes.

It should be said that the term, "constitutional exercises," is often used in connection with the daily practice of ten or fifteen minutes of exercise in the morning as a means of maintaining health, and especially among business men who have no interest in gaining any special degree of strength, but who feel

that a few minutes of free movements each morning will keep them in good condition and better fitted for their work. The term is rightfully applied in such cases, for, as I have said, all exercises are constitutional in their effect, and yet prolonged but moderate exercise in the open air, walking, for instance, is so much more important and effective as a means to health than a limited few minutes of free movements, which may after all be intended chiefly for strength-building, that it is better to regard the former as one's chief constitutional exercise and to take it faithfully every day, no matter what else you may do in the way of special movements.

DIET AND ATHLETICS.—The average person imagines that an athlete is a mysterious person, gifted with remarkable powers. This is an error. Every man and every woman should be an athlete, for to be an athlete means that one is capable of handling the body easily and gracefully and utilizing the muscular power to the fullest possible extent. It means the ability to run and jump, and the possession of strength of the arms and body. These manifestations of strength in the body of an athlete do not indicate possession merely of extraordinary muscular strength. They usually also indicate nervous energy and internal functional strength. To the average individual, when one speaks of muscles he is supposed to mean the biceps of the upper arm. This is a mistake. Muscles are used in every function of the body, whether voluntary or involuntary. The most perfect athlete is the one whose nervous and muscular systems are the best nourished and under the most perfect control. Therefore, I believe that every man and every woman should be an athlete.

The fact that athletes generally put themselves under a course of training, which includes rather severe dietetic restrictions, has fostered the idea that the athlete is different from the ordinary person. But the reason for this training in reality is to overcome the evil results that have followed from improper dietetic habits, habits that no person at any time should allow himself to yield to. The athlete's body is subject to exactly the same laws that govern the body of

every other person. Hence, it is very evident that there are no foods that have any special influence on an athlete in increasing his powers in one way or another. The only manner in which diet can influence one's athletic ability, is by its effect upon his general health. Hence those foods which are most satisfactory for ordinary purposes are also the most satisfactory for athletes. The foods that build the greatest amount of energy and enable one to acquire the greatest possible degree of vitality to be used in mental work would be equally useful for purposes of physical activity of any kind.

The dietary of the average man contains many articles of food which are neither wholesome nor strengthening, and while they are unsatisfactory for use at the training table of the athlete, they are equally unsuitable for food at every other table. One of the greatest mistakes of the average athlete is his habit of eating too much. This is a great drawback to one's success, and sometimes has much to do with growing "stale," which is rather a frequent experience among athletes. It requires all one's functional energy to digest surplus food. In my own experience, I found that the best work could be done on two meals a day, and I feel convinced that greater endurance can be secured from a vegetarian than a mixed diet. Hard athletic work may require a greater proportion of nitrogenous elements in one's food than usual, and these can be secured from peas, beans, lentils and nuts, instead of from meats, while eggs and whole-grain cereals are also satisfying. I would not advise one to drink water too freely immediately before strenuous exercise of any kind. Eat your usual foods when training for an athletic contest, for if you tried some unaccustomed article it might disagree with you. Eat your last meal at least four to six hours before the contest. It is absolutely necessary to have the stomach empty and in perfect condition when starting on a contest.

It is pretty well understood nowadays that the vegetarian athlete is not only the equal of his flesh-eating brother, but usually his superior. Time was when the "raw-beef" régime was largely followed, but intelligent trainers are gradually re-

ducing the percentage of meat, and in some cases, eliminating it entirely. It has been demonstrated in thousands of cases that while meat is a stimulating diet, it makes a greater tax upon the assimilative and depurating organs, and consequently is not a food that gives as great endurance as a less stimulating, but equally nutritious diet which does not tax the powers of assimilation and depuration.

It may be well to recall the fact that vegetarians in late years have many times evidenced their superiority in a variety of contests, some of which have already been referred to in these pages, and a few more of which are here recorded:

"Mr. C. Allen, the well-known amateur pedestrian of England, walked from Leicester to London, about one hundred miles, in twenty hours and twenty-two minutes, finishing in a singularly fresh condition, and without any blisters on his feet. His fare was vegetables, bread, oatmeal and a little fruit.

"Some years ago a Miss Rosa Symonds rode a bicycle for ninety-eight miles a day for eighteen and a half consecutive days on a non-flesh dietary.

"Two youngsters, Kurt Pfeiderer and Erich Newman, fourteen and fifteen years of age, respectively, neither of whom have ever tasted meat, covered a distance of one hundred miles on their wheels in England in six hours, seventeen and a half minutes, and six hours, forty minutes, respectively. Other remarkable performances by vegetarians on the bicycle include those of J. E. Newman, 175 $\frac{1}{4}$ miles in twelve hours, and T. H. S. Younge, one hundred miles in five hours and twenty-three minutes. Chas. Miller, the well-known ex-cycling champion, never touches flesh food during training, his trainer being a strict vegetarian.

"Yet other athletes who religiously endorse a vegetarian diet are Eustace Miles, the ex-amateur tennis and racket champion; Miss M. A. Scott, until recently the holder of the swimming record for one hundred yards and sixty-six yards; W. de Creux Hutchison; H. E. Bryning, the champion pedestrian; and a number of equally prominent British athletes.

"C. B. Fry, who, according to Arthur F. Duffey and other authorities, is the greatest all-round athlete that England ever produced, asserts that a vegetarian diet, consisting of cheese, nuts, grain-foods, fruits and salads, is ideal for athletes.

"In April, 1904, the members of the London Trade Organization of Outfitters had their annual walk from the English Metropolis to Brighton, fifty-two and one-quarter miles. The winner covered the distance in nine hours and twenty-four minutes, doing the last five miles in fifty-one minutes and forty-five seconds. He was a vegetarian and through a misunderstanding walked the first twenty-five miles of the journey without food.

"The French long distance bicyclist, Huret, a few years since, rode 545 miles in twenty-four hours on the Paris winter track. His speed averaged twenty-two miles an hour from the start to finish. During the contest, his food consisted of thirty eggs, three quarts of boiled rice, milk, some tapioca, chocolate, fruit and Vichy water.

"Marcus Hurley, of New York, ex-one-mile bicycle champion of the world, has been a strict vegetarian for a number of years. He won the title in question in a contest which took place at Crystal Palace, Sydenham, London, his opponents being J. S. Benyon and L. B. D. Reid, both meat-eaters. Mr. Hurley is also captain of the Columbus Basket Ball Club.

"One of the most remarkable pedestrian performances was that of a vegetarian athlete: that of Mr. Allen to whom allusion has already been made. In the fall of 1904 he started from Land's End Hotel in Cornwall, England, and walked to John O'Groat's, Scotland, a distance of 908½ miles, which he covered in sixteen days, twenty-one hours and thirty-three minutes. The average mileage was fifty-three miles a day. In the last five days the enormous average of sixty-three miles a day was attained, and in the final two days, 140 miles were covered. Mr. Allen beat the best previous record for the distance by seven days, finishing in splendid physical condition. He is, as already said, a consistent vegetarian. It should be added that up to the age of sixteen years he was extremely

weak and sickly. Having overheard the doctors say that he would never be strong, he determined to confute the assertion, which he did by becoming a vegetarian and a physical culturist. With the adoption of a non-meat diet, he began to improve until he became the athlete which he now is.

"A well-known Scotch amateur athlete, J. Barclay by name, a strict vegetarian, won during one year eleven firsts, seven seconds, and five thirds, in running races which included distances from two hundred yards to ten miles. His fastest mile was done in four minutes, twenty-four and two-fifth seconds. He is the ex-holder of the half-mile running Scottish championship.

"Another enthusiastic vegetarian athlete, J. Miller, of Larkall, Scotland, has walked ninety-five miles in twenty-two hours."

In one of the first six-day bicycle races held in Madison Square Garden the winner who rode about three thousand miles in six days ate absolutely no meat during the entire race.

More recently some of the most successful and brilliant of Marathon runners have been vegetarians, attributing their success to this fact.

Hence it will be seen that actual experience has demonstrated that meat-eating is not essential to the success of athletes. The vegetarian diet is found to be all-sufficient to produce all the energy needed for the most violent contests, and therefore it is not unreasonable to assume that it can satisfactorily meet the demands of the most exacting occupations.

To these names must be added that of Fred Welsh, a boxer of championship caliber, who is equally known on both sides of the Atlantic, and who has contributed a series of boxing lessons to this work, as well as a host of other celebrities in the athletic world, who do not pin their faith to the meat-diet as a means of developing energy and strength.

DELSARTE SYSTEM.—The so-called "Delsarte system" is not truly a system of physical training, as is often supposed, but a system of expression, intended chiefly for students of dramatic art. Delsarte formulated a very elaborate system of

"Æsthetic Gymnastics," but while valuable in the way of gaining control of the body and for the promotion of grace, they have no special advantages in the building of health and are therefore not illustrated here.

DUMB-BELLS.—Small dumb-bells are very popular and much used in exercise drills. Large dumb-bells and their uses are discussed in connection with *Weight Lifting*.

The small dumb-bell is, on the whole, a very satisfactory form of apparatus, taking up little space, being inexpensive, and adding to both the interest and effectiveness of free movements and calisthenics. Almost all such exercises which are taken without apparatus may be made a little more vigorous by the use of dumb-bells. In ladies' drills, wooden dumb-bells are often used, having very little weight, but iron bells are usually more effective, in weights from one and a half pounds up to five pounds. They are especially valuable in arm exercises, but bells above five pounds in weight are seldom to be recommended for all-around exercises, since they tend to make the movements slow and to stiffen the muscles. The weight suited to each individual will depend upon his or her strength, but in all cases they should be such that the exercise may be performed freely and with pleasure. It is easier to make a mistake in getting them too heavy than too light, in most cases. The dumb-bell has the advantage of offering a uniform resistance at all points or positions of a movement.

EXERCISE AND ITS ESSENTIALS.—As the student has already seen muscular exercise is absolutely essential not only for the development and strength of the muscular system itself, but for the sake of maintaining that tone and activity of the functional system which makes for perfect health. There are many of those who have such good health that they lose interest in the thought of health for its own sake, forgetting that there is such a thing as ill-health, and whose chief active interest in exercise has to do with the desire for robust physical strength. But yet others there are, who, lacking in physical energy and health, are merely anxious to gain the

latter, who simply wish to "feel well," so that they may accomplish their work and enjoy their pleasures, but without any special interest in the attainment of bodily strength. To such it is necessary to make clear and to emphasize the fact that health and strength really go together, that they cannot be so readily divorced, and that in order to enjoy anything like a normal condition of health or of nervous energy, working energy, it is essential to take such daily muscular exercise as will build up and strengthen the body until it is physically perfect, a robust and splendid example of animal life.

There are many forms and systems of exercise which answer the purpose with absolute satisfaction, and though there are some which have faults and are inferior to others, it is because they depart from the natural order of normal physical effort. In the endeavor to offer something unique and distinctive, various mail order specialists have devised what are supposed to be remarkable methods of muscular development, their advantage and value being greatly exaggerated by the necessities of advertising and selling, but in no case will one secure any instruction along this line more helpful or beneficial than the advice and suggestions for exercise presented in these volumes. I am not in any way opposed to the enterprises of correspondence instructors in physical culture, for they stimulate interest and unquestionably accomplish a great deal of good among people who might otherwise neglect their bodies entirely, but as a matter of truth and fact, some of the systems advised and taught are too one-sided or narrow in their scope to accomplish the best results. But aside from some of these ingenious but limited "systems," almost any method of exercise which thoroughly uses all of the muscles of the body in a natural way, and in accordance with some of the essential conditions which it is my purpose to point out here, will prove satisfactory. Sometimes it is well to turn frequently from one method of exercise to another for the sake of variety, in order to be certain of using all muscles in every possible way and thereby acquiring the most symmetrical development of all parts.

I have always made it a point to emphasize the importance of the play spirit in exercise and to recommend the practice of outdoor sports and games. However, even these are not entirely sufficient in most cases, and nearly every one needs at least a certain amount of special systematic exercise for the sake both of symmetrical muscular development and of health. Most games afford good all-around exercise, but yet they often neglect certain muscles and leave the individual far from symmetrical or perfect. A close observation of athletes will disclose the truth of this, for one will often see an athlete successful in his particular specialty who is round-shouldered and flat-chested, or otherwise one-sided or defective in build. One will sometimes see a good ball player standing in a most awkward and ungraceful attitude. He needs special training. It is true that he already has just sufficient muscular power for the requirements of ball playing, but he would greatly improve his playing if he perfected his development, neglecting not a muscle of his entire body, and thereby developing a degree of strength, co-ordination, accuracy of movement, ease, grace and speed that he never enjoyed before. Special training for various individual defects is sometimes as necessary for the athlete as for the business man.

The reasons for this lie not only in the necessity for using all of the muscles, but also in using them properly and thoroughly. The movements of everyday life are usually more or less limited in their scope, and even when a muscle is called into play for some purpose, the chances are that it is used for only a partial rather than a complete movement of the member concerned. Suppose that the construction of the joint and the muscles having to do with the movements of a certain part is such that the member may be moved through an arc of one hundred and eighty degrees or more, then an exercise for the muscles concerned, to accomplish the best results, should bring about a complete movement of the part throughout the full scope of this arc. In the ordinary movements of everyday experience, the member is probably moved, when at all, through a small segment of forty-five to ninety degrees, or

even less, which certainly would not be sufficient to keep the muscles affected in good condition. And if the special exercise is such that movements are *incomplete* in this way, or in other words, if they operate through only a segment or fraction of the full arc representing the action *possibilities*, then such exercise is unsatisfactory to just the extent that the movement falls short of its possible full scope.

Many outdoor games which are invaluable for constitutional reasons fail of satisfying all the requirements of exercise and development because of this incompleteness of movement, as well as the complete neglect of certain muscles in some cases. Special exercises, therefore, should be such as require the most complete extension of the affected members, when they are extended, and the most perfect flexing when they are flexed. Halfway movements are of little value; every action should be carried just as far as the anatomy of the parts will permit, so that the contractile power of the muscle may be just as great at any one point as at another. A manual worker may be so employed that he is accustomed to use the biceps with the arm bent at an angle of ninety degrees, and he naturally finds that he can use his biceps best with the arm in that position. In such a case he should take special exercises which will give him as much contracting power when the arm is extended and when it is tightly flexed, and, preferably, the resistance should be the same in all positions of the part.

For this reason, elastic exercisers, of either spring or rubber construction, in which the resistance increases rapidly with the distance of the stretch, are not strictly ideal. Even with this drawback, these wall exercisers are valuable to those who otherwise might neglect their exercises. This difficulty was very largely overcome in some elastic wall exercisers of the writer's own invention years ago, but in comparison with most spring and elastic devices the so-called chest-weight pulley machines are preferable. The weight used provides for a uniform resistance at all points of the movement. Exercises which employ the weight of the body itself as the form of resistance are ideal in this matter of uniform resistance, and

where the movements are complete, they offer an absolutely satisfactory form of exercise.

From the foregoing the reader will see clearly that exercises which call for the contraction or exertion of the muscles in a more or less stationary position, no matter how vigorous, are less satisfactory than those which involve movement. Stretching exercises, referred to elsewhere, can be recommended for their complete extension and flexion of the parts, but they lack the element of movement. The ideal movement exercises, however, should involve the principle of stretching at the termination of each movement. In other words, with each extension or flexing of any part of the body in systematic exercise, the various members should be brought to a point of momentary *stretch*. This is a most important consideration, and one which should be applied to all exercises. Exercises for development should not be made in such quick succession that they limit the scope of the movement.

Another essential of the ideal exercise is the provision for frequent relaxation rather than prolonged contraction. Alternate relaxation and contraction is the most perfect scheme, both for the health and the strength development of the muscles. A period of relaxation after each contraction allows for the free circulation of blood through the meshes of the muscle, the capillaries being suffused and the muscle cells given the advantage of a fresh and adequate supply of oxygen. Long continued stress or tension, especially when there is little or no motion, seriously interferes with the blood supply, the muscle becomes rapidly fatigued and does not recuperate so readily. It is like a condition of "cramp" which is a violent and involuntary contraction lasting for a considerable time. Most of us have experienced such cramps at one time or another and know how painful they are, but they are just as antagonistic to the welfare of the muscles as they are painful. Physiologically a muscle is spoken of as "tetanized" when it is so cramped, and exercises which involve long continued and vigorous contraction may be termed "tetanizing." They decrease the irritability of the muscle, interfere with its

best nutrition and even cause more or less atrophy. Holding a weight at arm's length as long as one can endure it, is an example. It may be a test of endurance and will power, yes, a test of strength, in a way, but as an exercise it is an absurdity if not an injury.

The important principle of relaxation is one to be kept in mind always, both with reference to exercise and other matters. My comments upon the subject on page 743 of this volume should be carefully noted. In exercises for developing speed it is essential that each movement should commence from a relaxed condition. A series of movements in opposite directions in quick and immediate succession would be unsatisfactory for the purpose, because one movement would interfere with another, opposite muscles working against each other a part of the time. Before one motion is completed the antagonistic muscles are already at work to commence the next and the movement is likely to be incomplete. A moment of pause and relaxation would enable one to move with much greater speed as well as with greater power. Scientific boxers know this, as do also sprinters who have mastered the fine points of starting.

Exercises for muscular development should be neither too slow nor too fast, though if in doubt it is often better to favor the slower movement. There are two difficulties that one is likely to fall into when trying to do exercises too fast, that is to say, when not actually training for speed, and these are the tendencies to do the movement with a swing or a jerk. In training for grace and ease of action, it is well to learn to do things with a swing, for it is the most economical as far as the expenditure of energy is concerned. In handling weights or other objects, and in many athletic pastimes, it is the swing which counts, for it means ease and consequent power. But if the purpose of an exercise is to develop a muscle, that purpose will be largely defeated if the movement is executed with a swing, in which mere momentum will carry through the movement, once it is started. Muscular action and not momentum, should be the moving force, and in case of such a

tendency the movement would better be made slowly, so that the muscles may "feel" the resistance, as it were, all the way through. The same thing applies to doing things with a jerk, in which all the effort is made in the beginning of the movement, and probably in part by other muscles remote from those intended for use in the exercise. For instance, in pushing a weight over the head with the hands it may be the intention to use the deltoid and the extensor muscles of the arms. In executing the movement slowly these muscles would be in action all the way up, or through the complete movement. But in the jerk, in nearly every case the body will be lurched upward by a jumping action of the legs, giving sufficient power and momentum in this way to send the weight all the way up, and without employing the arm and shoulder muscles as planned. Jerking and swinging are legitimate elements of weight lifting, but they must be avoided in exercises for purposes of development. Of course there are some forms of exercise and many games which are energizing and stimulating to a high degree, in which speed and snap are desired, and in which slow movements would be out of place.

The question as to the advantage or advisability of light or heavy exercises is one that depends very much upon the individual and upon the purpose which he wishes to accomplish. Those who are not strong, certainly should not attempt heavy exercises, while those of robust build and fair condition often will get the best results from heavy exercises, or at least a little heavy exercise, even for health. As a rule, the lighter exercises may be recommended for their constitutional benefit, and for gaining strength sometimes a combination of light and heavy exercise.

For the building of actual strength, light exercises will not go very far. Extended repetition of a light movement will mean a gain in endurance but only a very slight increase in strength. For instance, a light exercise which one can do ten or twenty times with ease and comfort will take very little more strength to do it two hundred times. A man may be able to lift a ten-pound weight over his head ten times,

but this does not mean that he can lift a hundred-pound weight once. Endurance and repetition in light exercise, therefore, do not mean much increased power. The lifting of the heavier weight in this instance will require a very powerful muscular contraction, and this can be brought about only by exercise and practice in contracting the muscles concerned against greater resistance.

The building of strength requires that one exert his strength, vigorously, though without straining. Nature, ever conforming to changed conditions, and ever ready to respond to any special demands made upon her, will meet the demand for strength by building up the muscular cells and fibers accordingly, until in time she meets the normal limit of possible development. The building of great strength, therefore, proceeds along the line of a progressive increase in resistance. One begins with exercises which require only a moderate degree of strength, or in other words, a moderate power of contraction in the muscles. As this contractile power increases with the growing size of the muscles, gradually more difficult tasks are undertaken. Light exercises, however, will carry a person just so far, and no farther. Even two or three powerful contractions of a muscle every day, against great resistance, will develop and maintain more muscular bulk and strength than the repetition of a very light movement a thousand times.

Outside of athletic requirements, or those of some heavy occupations, there is no special advantage in attaining a massive development. Health and nerve-energy are the all essential thing, and exercise is necessary up to a certain point to promote this health and develop energy. The body must be normally strong and vigorous and the circulation active, and with a moderate amount of vigorous systematic exercise each day, and as much mild constitutional exercise in the open air as one can find time for, one should keep in the best possible physical condition, granting that he does not violate other essentials of health.

FACE, EXERCISE FOR THE.—The entire face is well covered

by a system of muscles. Every slightest movement of the face or of the skin of the face is the result of the action of one or more of these muscles, from a smile to the winking of an eye. And just as the beauty and symmetry of the body as a whole depend chiefly upon the development of the muscular system, so the development or condition of the muscles of the face has something to do with its contour and character. There is no doubt that in many cases the appearance of the face may be improved by special exercises intended to develop these muscles, filling out the physiognomy in many cases where it is drawn and apparently more or less wasted, doing away with surplus fatty tissue in some instances, but always improving the local circulation and giving firmness and character to the flesh of the face as a whole.

The distorted features of a little baby crying give one an idea of the muscular character of the little face, even though its softness in repose would seem to suggest the idea that it is composed chiefly of fat. The truth of the matter is that there is both muscle and fat in the childish face, the latter making it smooth, but the former giving it definite shape, that is, supplementing the bone structure underneath. The average baby laughs and cries whenever occasion demands, which is usually not infrequent, and so exercises these little facial muscles that they are well developed, and the face full and firm. But that the momentary wrinkles seen in crying are not permanent is seen in the smoothness of the surface.

Men and women, however, commonly neglect the muscles of their faces, for they seldom cry, and do not always laugh as much as is good for them. In many cases, therefore, these muscles partly waste away, detracting from the appearance of the face. Actresses, actors, orators and clergymen who use the facial muscles a great deal in forcible expressions of emotion, usually have uncommonly handsome faces when their health is not such as to interfere. The momentary wrinkles of the skin produced in such vigorous expressions of emotion, of simulated emotion or in special facial exercises, as in the case of the crying babe, do not remain. It is only

the habitual expression, whether sweet, smiling, worried or ill-tempered, which becomes fixed, so that one need not hesitate to take up special exercises for the face for a few minutes each day for fear of producing lines. The improved circulation and better nourishment of all the tissues of the face will do much more to prevent wrinkles. To many faces which are commonplace character and charm may

be given by filling out these muscles to their full development. People have wondered at the manner in which some famous actresses seem to retain the aspect of youth, but probably the greatest reason is the exercise of the facial muscles in intense

dramatic expression, and the consequent development and well-being of the entire countenance.

The only way in which one can really exercise these muscles is by "making faces," which if done vigorously will bring about the contraction and the stretching of all muscles, and bring the blood to this part of the body in large quantities. The act of yawning is an involuntary and instinctive exer-



Inflate the cheeks as much as possible, at the same time drawing the upper lip downward. Force the breath through the tightly closed lips.



Thrust the tongue into the cheek, forcing it outward as much as possible. Press the tongue all over cheek and pass over to other.

cise of this kind, just as is the stretching of the body upon awakening. In taking special exercise of this kind for beautifying the face, one should stand before a mirror, and then make it a point both to contract and to stretch every part of the face, from the forehead down to the throat. In the beginning it might be well to be moderate in the matter. One who is subject to nose-bleed, for instance, may have some little weakness of the walls of the arteries and capillaries, and might cause rupture of these in too violent effort. But after a couple of weeks the contractions and stretchings of the muscles may be made as vigorous as possible, always bringing them to the fullest and hardest stretch for a moment only, and then relaxing.



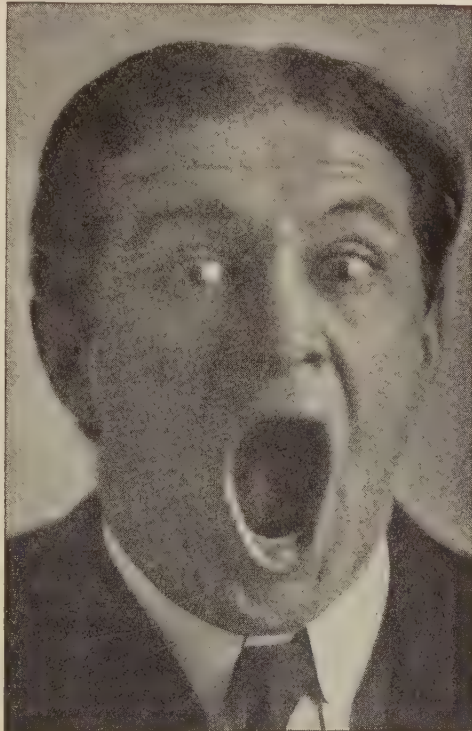
Twist the mouth over to one side, at the same time tightly closing the eye on that side. The face muscles are to be put on a "stretch" as much as possible. The cheek muscles are brought into play, and the eyelids and eyebrows exercised. Regular active exercise of the muscles will improve the contour of the face.

The following exercises are suggestive. It will be a simple matter to devise other similar exercises or variations. Shut the eyes tightly, brows contracted. Stretch eyes open wide, raising brows. Shut eyes tightly, raising brows. Squint eyes tightly, eyes open. Shut one eye tightly at a time. Depress one brow at a time, raising the other. Depress brows and try to draw scalp of top of head backward stretching forehead. Draw scalp forward raising brows. Pucker mouth and draw hard to one side, then to other. Curl up the nose, as in a sneer, trying to wrinkle it if possible.

Pucker and pull mouth together as tightly as possible. Smile broadly and very hard, until the cheeks seem to "pull." With open mouth pull the upper lip down hard over the upper teeth and into the mouth. Pull out and down the corners of the mouth. In doing this it may help to contract the *platysma myoides*, the spreading, fan-like muscle of the front of the neck, running down to the chest (see illustration Vol. I), thus distending the throat. Yawn wide. Bite teeth together hard. Pull cheeks and ends of mouth upward. Pull lower jaw to one side, then to other, tensing muscles hard. Draw jaw inward. Thrust jaw outward. With jaw thrust forward, pull upward with lips. With mouth open, try to pull lips together. The movements of upper part of face may be combined with those of lower part, if desired, placing stress upon the entire face at once, though better concentration is secured by taking parts separately.

In connection with the above, in some cases, the exercise for strengthening the teeth given later in this work will be of great advantage, involving the muscles of the jaw. All of these exercises will help to give the face an expression of strength and character, as well as greater beauty.

As a means of helping to fill out the cheeks, when they are sunken and to make more firm or reduce those too fleshy,



A "stretching" exercise for the face. Yawn vigorously, opening the mouth completely and raising the eyebrows. Then shut mouth tightly and lower eyebrows. By this means the contracting muscles of the face are exercised, and a pull exerted on every part of the face. Flaccidity of the tissues can be avoided or to a great extent overcome through such vigorous exercises, and the circulation improved.

the exercises described may be supplemented by filling and puffing out the cheeks with air, lips tightly closed, and also by forcing out the cheek with the tongue, rolling it around in each cheek. Any thing that will invigorate the tissues and improve the circulation will help.

If fashionable women, in search of better complexions and facial beauty, would adopt these methods of improving the face, together with such measures for the promotion of their general health as would build vitality, invigorate the general circulation and provide for better assimilation and nutrition, instead of using cosmetics and visiting "beauty parlors," which are anything but places where beauty is to be found, they could accomplish something real and permanent in adding to their attractiveness. Artificial methods, working against Nature, cannot help but harm and destroy. In some high priced beauty parlors poisonous chemicals are applied to the skin to improve the color. The malignant irritation which results does truly enough bring the blood to the skin in large quantities, to remain for a couple of hours, but the color is the unnatural red of irritation and inflammation and the effect is ruinous. In every case better color for the evening may be secured if one wishes to force herself in this way, by the alternate application of hot and cold wet cloths to the face, or rinsing alternately with hot and cold water. Not only is the color a natural and healthy one, but it is also more lasting, and especially so when it is influenced also by exercise, both of the special facial muscles and of the body generally.

GYMNASIUM WORK.—In the following pages appear several series of exercises suitable for class work. These movements are of a comprehensive character, embracing all-round movements for the general development of the entire body. They are intended to be of special value to clubs and schools where it is desired to take up physical training in classes. It is naturally understood, however, that it is not necessary to do them in class, for they will serve just as well when taken individually in one's bedroom, either morning or evening.

GYMNASTIC DRILLS AND APPARATUS WORK.—The modern gymnasium is an institution that has come to stay, growing up out of the need for some adequate provision in our cities for that physical activity and muscular training which under more natural conditions one would engage in out of doors. There is no question of the superior value of all games and exercises in the open air, but next in value to this is a large, well lighted and thoroughly ventilated gymnasium. There has been reason for complaint in the past on the score of lack of ventilation in many places used for gymnasium purposes, but buildings for this purpose of recent construction are usually well provided with large and numerous windows. What is better still, there is a growing tendency in the direction of outdoor gymnasiums, and most of our up-to-date cities have placed various forms of gymnastic apparatus in their public parks and play-grounds for the benefit of the children. When there are enough of these to accommodate adults as well as children, in addition to numerous open fields for other games, we will see a great difference in the general health and vigor of the great masses of the people.

It is true that gymnastic apparatus is not essential for purposes of exercise or the development of strength, as the reader has noted in his perusal of other portions of this chapter, but it is also true that the use of apparatus often helps to add interest to one's endeavors in the way of training. Many forms of apparatus have a distinct fascination, and especially so because they tend to develop a high degree of grace and muscular control, as well as mere strength. In many forms of this apparatus work, and these the most valuable, the resistance is afforded by the weight of the body itself, and the result is a development which is absolutely normal and perfectly in proportion to the build and weight of the individual.

A very popular form of apparatus for the home is the elastic wall exerciser, the elastic quality of the rubber strands or spiral springs of which give the necessary resistance. The equivalent of this is supplied in most gymnasiums by a so-



A good type of elastic wall exerciser, suitable for home or bedroom use. Frames are fastened to the wall, over which the ropes are run on pulleys. Weights are attached to the lower end of the ropes, the upper ends being held by the operator as shown in the picture.

called "chest-weight" exerciser, in which weights, on a pulley system, give a similar resistance. These exercisers, equipped with weights, may also be used in the home. Many sizes are now available and are made in neat designs and can be easily attached to the wall. These are not used in class work and are not suitable for developing the entire body, being especially adapted to the use of the muscles of the chest, arms and

shoulders. By referring to the *Class Drills* given in this chapter, one will find certain movements used in connection with dumb-bells and in calisthenic work which may be adapted for use with a wall exerciser. Indeed, any movement which may be performed in such a way as to operate against the resistance of the exerciser may be taken with advantage by using such a device. Naturally, movements for arms and chest are taken with back to the exerciser, and those for the shoulders facing it.

The punching bag is also a common and popular form of apparatus, usually found in the well-equipped gymnasium, but also suitable for installation somewhere in one's own home. It is noisy and of a nature to cause more or less vibration, so that it is usually better to have it placed out of doors in the back

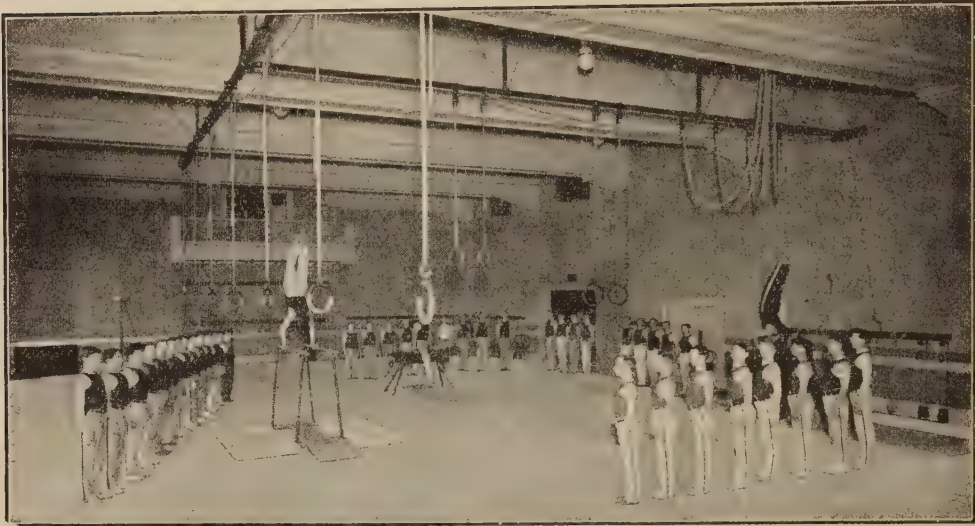
yard, if convenient, or in a shed or barn loft, rather than in the living rooms of the house. It is frequently placed in basements, but the latter are not always well enough ventilated for purposes of healthful exercise.

One may in time become very skilled and clever in bag punching, giving very pretty exhibitions, but for purposes of exercise I would say that the simple movements are just as good as any, probably better, because they permit one to strike the bag with full strength. The repetition of light taps in many forms of fancy bag punching soon becomes mechanical and does not require enough energy to give really good exercise. Better to hit it hard on alternate rebounds.

There are some rather elaborate and expensive machines supplied in many large gymnasiums, which have very little value. There are wrist bending machines, for instance, which will not accomplish a fraction as much for strengthening the wrists as some forms of apparatus work in which the weight of the body is supported by the hands. Of all forms of apparatus, the vaulting horse, the parallel bars, the rings and the horizontal bar are the most valuable and the most commonly used, and I am offering some illustrated exercises upon these forms of apparatus, suitable for class work if desired.

For class drills upon the apparatus, it is usual to divide up a large class into "squads" of six or eight, appointing as leader the one most proficient and skillful. These different squads are assigned to the different forms of apparatus in the gymnasium, one squad taking the horse, the next the parallels, another the horizontal bar, and so on, exchanging and taking turns on each as they finish, so that all pupils will have used the same apparatus when they are through. It should be said that where there are calisthenic or other class drills on the floor, these are taken up first, with the entire assembly, followed by the division into squads and the apparatus work.

Each squad forms in line, the leader first executing an exercise on the apparatus, not only indicating what the exercise is to be, but also showing how to do it. Then the first in



Men's classes at work in a gymnasium.

line steps forward, goes through the exercise, and takes his place at the back of the line while the second in line takes his turn. After the entire squad has performed this particular movement, the leader executes another, followed in turn by each member of the squad. The simplest and easiest movements are naturally taken first. After the squad is through with the horse, it takes up the parallel bars, some other squad then using the horse, and shifting all around.

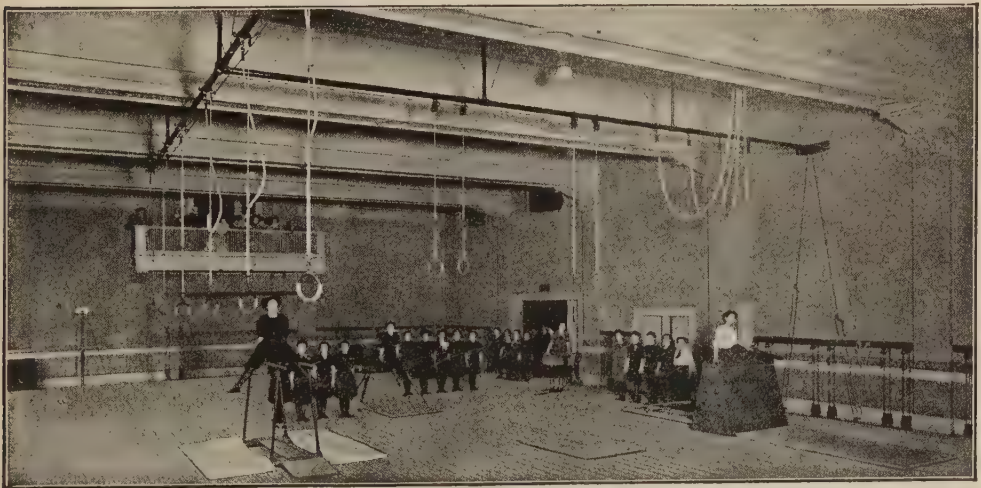
These forms of apparatus are of splendid value in developing the arms, chest, shoulders and the muscles of the sides—in short, the entire upper body. They will soon show a conspicuous development of the *latissimus dorsi*, giving that breadth under the arms, and width of shoulders and chest which we associate with virility and robust manhood.

Tumbling is another form of exercise which may be practiced upon the well-padded mats of the gymnasium, and it should be said that it is one of the most delightful and fascinating of exercises. It is not to be expected that the average gymnastic pupil will ever reach the extremes of startling acrobatic tumbling witnessed in the circus, nor is it desirable to

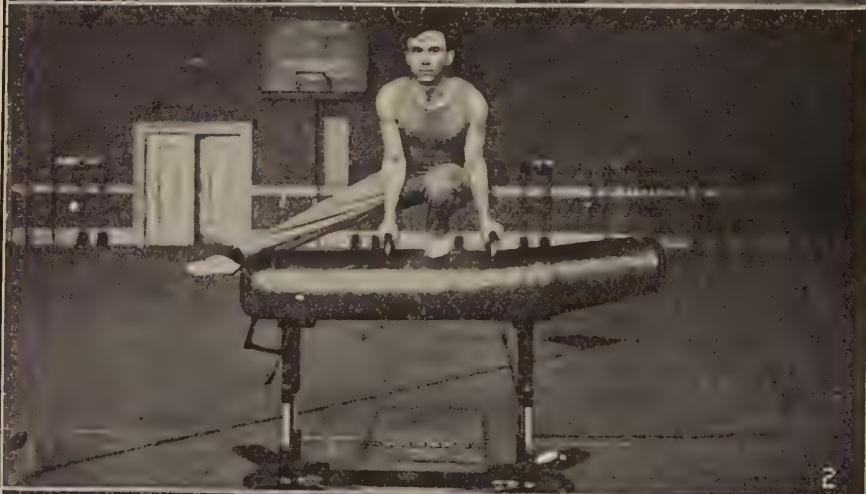
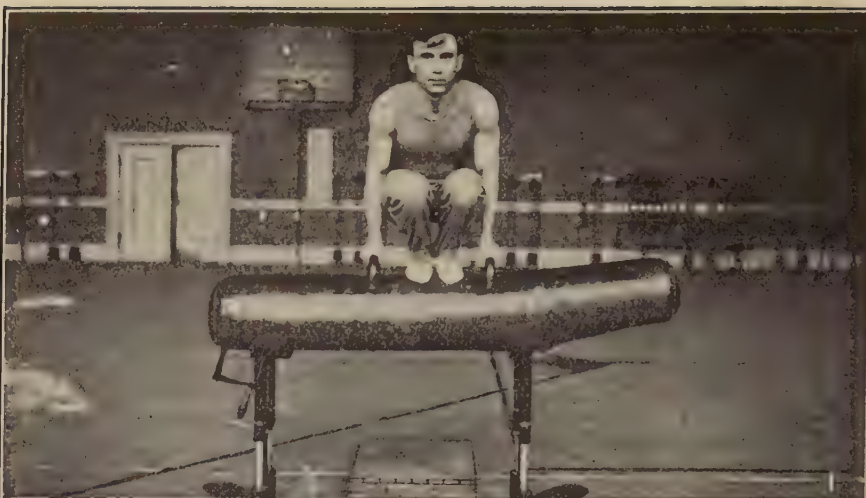
accept the dangers of such feats. But there is a variety of simple tumbling movements which are attended with no risks to life or limb, but which will probably yield just about as much pleasure as the difficult, fancy feats, besides being of a nature to promote the best bodily development. It is this version of tumbling which is taken up in the exercises which follow, and which can be highly recommended for the average pupil in all gymnasiums.

Let me suggest, also, the practice of tumbling out of doors when convenient opportunity permits. A smooth lawn, especially when soft with a thick growth of short grass, is always inviting to any one who has grown fond of tumbling, and the turf is even more satisfactory than the best gymnasium mat, if one wishes to tumble or roll.

At either place the various somersaults, handsprings, shoulder-springs, etc., or wrestling may be practised, or the various reclining exercises may be taken. This method of exercising is especially valuable as it permits one to relax groups of muscles not particularly involved in a given move, while at the same time those muscles exercised are brought into vigorous action, insuring their gradual development. Such exercise necessitates thorough skin cleansing, to prevent development of boils and eruptions from dirt and contamination.



Class of young women receiving instructions in gymnastic exercises.



EXERCISES ON HORSE.

No. 1. Squat Vault, forward or backward. First facing horse, take hold with the hands as shown, and vault over by doubling the knees high and jumping through between the hands. Backward the same way. While learning to do this, and until the pupil is absolutely certain of executing the movement without a hitch, the instructor should stand on the side which pupil is approaching, ready to catch him in case of a fall. In the beginning, if the pupil is awkward, there is always the possibility of not getting the knees and feet high enough, and to trip would sometimes mean pitching forward head foremost. Often it is well to have two in readiness to help in such an emergency.

No. 2. Wolf Vault, left or right. This is a variation of the preceding movement, one leg over the center, and the other winging over the end of the horse. In this illustration it is the right leg, in which case, the right hand should momentarily let go of the handle at the instant of going over, quickly resuming the hold after the leg has passed over. The same should be executed with the left leg.

No. 3. Rear Vault, left or right. This is the simple, regular vaulting movement, which may also be executed over a horizontal bar when not above the level of the head, or over the ordinary fence in a cross country jaunt. Both legs are carried over one end together, with knees straight, the hand on that side letting go just when the body reaches the point shown in the illustration. Same over the other end.

These simple vaults should be much practiced until thoroughly mastered, after which one will feel more at home on the horse and ready for more difficult movements.



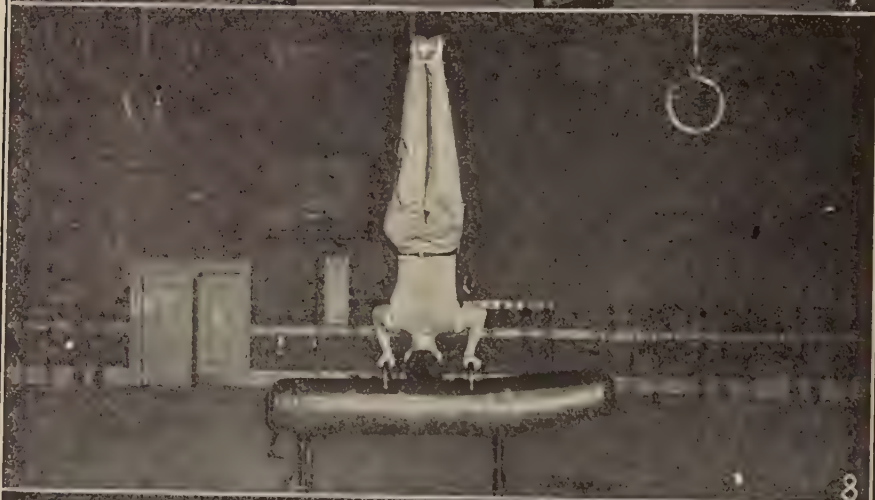
Full description of movements appears on opposite page.

EXERCISES ON HORSE—*Continued.*

No. 4. Straddle Vault, forward and backward. This should not be attempted until the preceding vaults can be executed deftly and easily, after which one will probably have no difficulty with this one. The legs are spread wide apart, one going over each end in the manner shown. Just as the feet clear the horse the hands should let go, the pupil alighting neatly upon his feet.

No. 5. Scissors, or Shears, forward and backward, left and right. First straddle the end of the horse somewhat in the manner shown in No. 6, but taking hold of the near handle with both hands. From this position lean weight forward on the hands, raise the legs quickly and cross them to the "Scissors" position shown in this illustration. First cross right leg under, as in this photograph, then return to original position, then cross left leg under. After becoming more expert you may be able to change from one side to Scissors on the other without stopping at first straddle position. Next straddle the same end with back to the center or saddle, hands on the handle behind you and execute the same movements.

No. 6. This illustrates a general position from which a great variety of exercises upon the horse may be started, sometimes with the hands on near handle, as in No. 5, sometimes with one hand on near and the other on far handle.



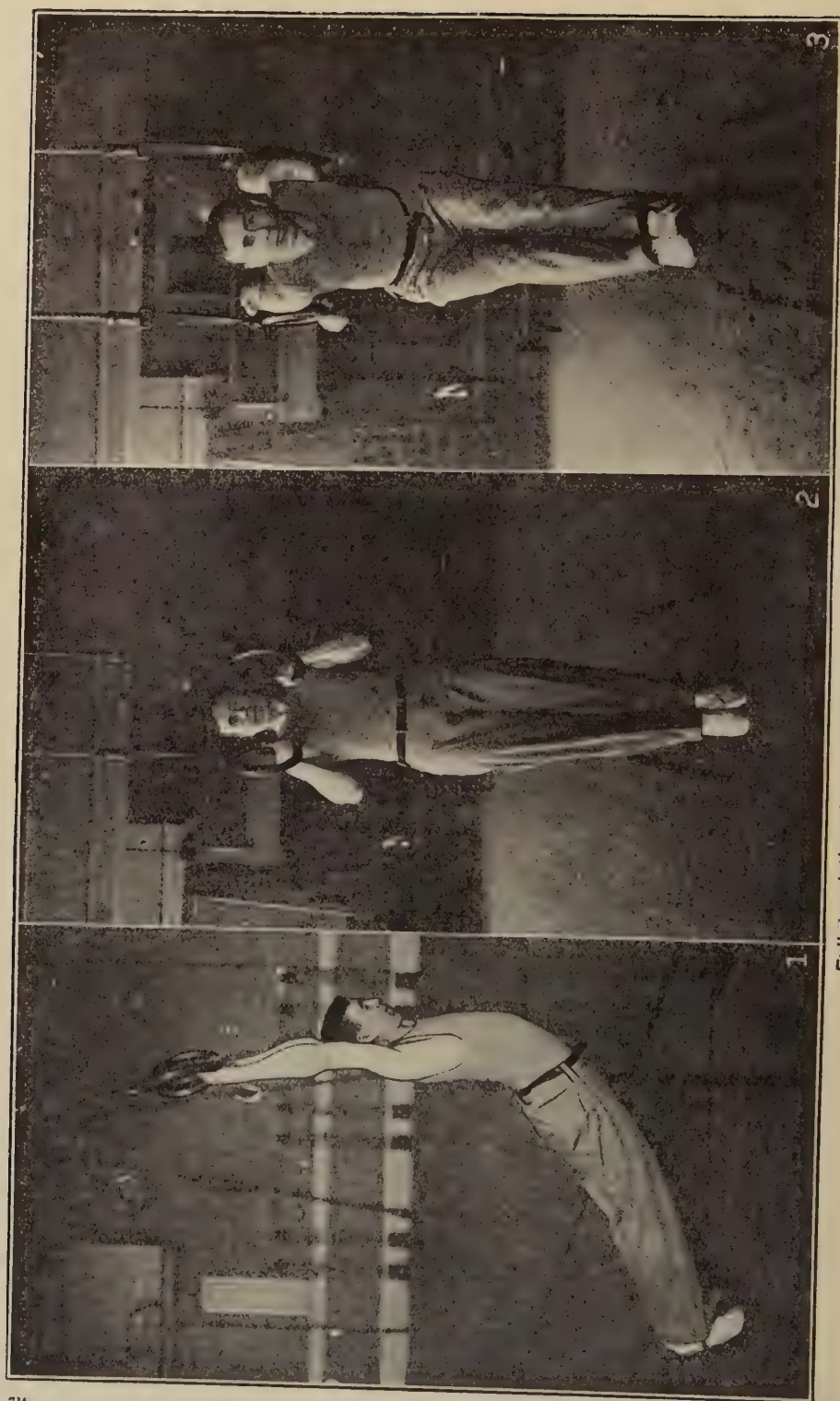
Full description of movements appears on opposite page.

EXERCISES ON HORSE—*Continued.*

No. 7. Stride with right arm in front. This movement may be executed starting with vault from the floor, or from the general position shown in No. 6, but with one hand on each handle. In the latter case, raise the legs and bring them together, knees straight, swing them around to the right and up over the further or right end of the horse. Just as this is done the right hand must momentarily let go its hold, the legs separated so that the right hand may resume its hold passing between them, and the movement continued around to the point shown in the illustration. It is essential to keep the weight well poised upon the arms, for one cannot slump through movements upon the horse; from this position swing back to starting point. This should be done first from the floor with a vault, for this is the easier.

No. 8. Head Stand on Horse. This is a position which should be reached slowly and deliberately, placing head on horse between the hands, first with body well bent and legs hanging down. Then slowly the back and legs should be raised until finally a full head stand is accomplished. The instructor and one other should guard against falling. The finish of the exercise should be a head spring over to the other side, a very safe and easy thing to do, but with instructor's hand on back at first.

No. 9. Elbow Lever. The elbow is well braced under the left hip and the other arm outstretched for balance. Commence with elbow lever on both hands, then gradually shift weight of body over to one side until balanced. Should be executed on each hand by turns.



Full description of movements appears on opposite page.

EXERCISES ON RINGS.

No. 1. Fall out, forward, backward and sideward, describing a circular motion of the trunk of the body, but keeping feet in the same spot as nearly as possible, all while hanging from the rings. The movement is like the swing around of a slack rope, in which the center of the body describes the largest arc, and the feet represent one end of the slack swinging rope. The body should face the same direction throughout. A splendid exercise for the sides and torso generally, and very good for stretching all parts.

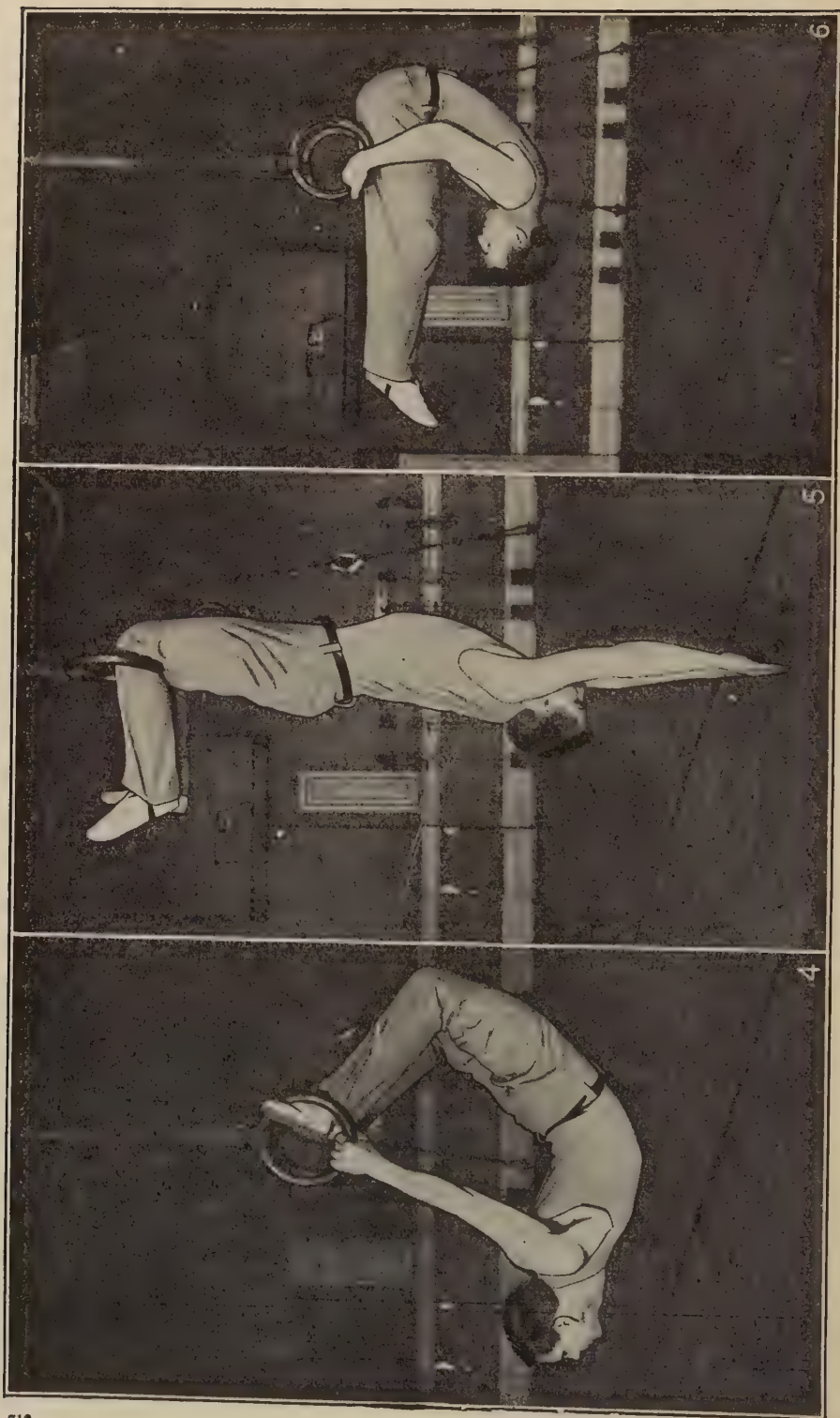
No. 2. Pull Up, from hand hang to bent arm hang, an ideal exercise for the biceps, though also affecting latissimus dorsi and other muscles of shoulders and chest.

(*a*) From this position, illustrated, extend the left arm to the side horizontally, holding the right flexed, and then, returning to this position, extend the right arm similarly. In this exercise the greater part of the weight of the body is supported by the flexed arm.

(*b*) Press Up, first with left arm, by raising elbow until directly above the hand, and then with right arm. Press up until arms are straight and at the sides.

No. 3. Press Up, from pull up position shown in No. 2, with both hands simultaneously, to position illustrated. Press up to straight arm.

(*a*) Flexing thighs and legs, roll forward, that is to say, raise hips and back until overhead, and rolling forward, allow feet and legs to descend in front, the body having described a circle, rolling over. Then, raising legs above the head and continuing backward, roll backward again to the same position. This is an excellent exercise for the shoulders.



Full description of movements appears on opposite page.

EXERCISES ON RINGS—*Continued.*

No. 4. Bird's Nest, either with or without swing. This position is reached from hand hang by first raising feet forward to rings, hooking in rings as shown, then pushing hips forward between the arms until the arch of the back and entire body is accomplished as illustrated.

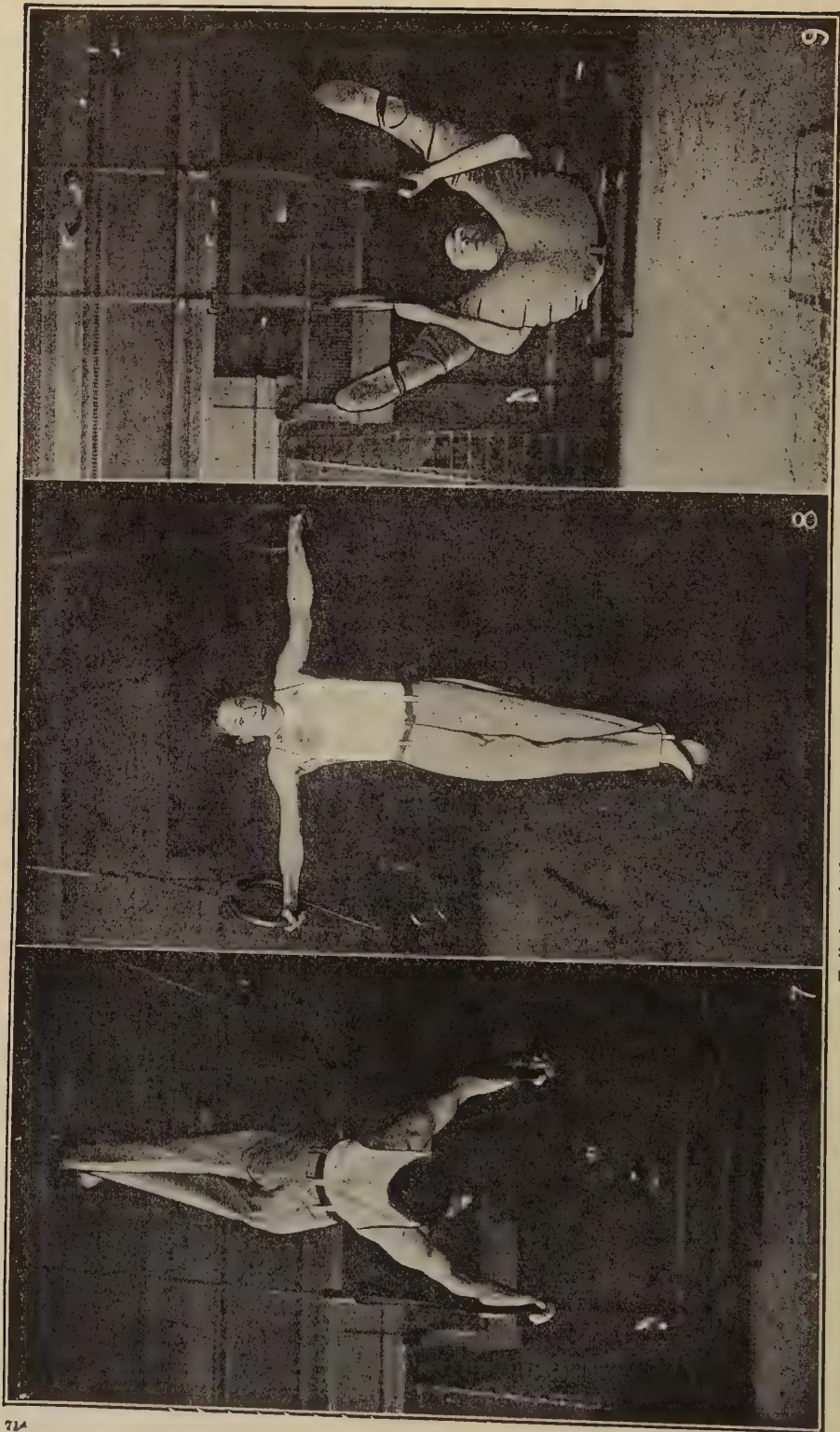
(a) If executed with swing, lower the feet at front end of swing, and release rings at rear end of swing.

No. 5. Knee Hang, with or without swing. This is one of the simplest and easiest of all positions on the rings, but the beginner should be sure that his legs are well flexed at the knees.

(a) From position illustrated to a riding seat, or in other words, raise head and arms forward and up, taking hold of ropes above rings, and pulling upward rise to a sitting position with legs through the rings. Now, throwing the arms through and in front of ropes, grasp rings, roll forward and dismount.

No. 6. (a) Position for Kip or Up Start on Rings. This is similar in principle and execution to the kip on parallel bars and on the horizontal bars. From the position illustrated, the legs should be forcibly extended, that is to say, kicked upward and out in an oblique direction, while the hips are held to the same position, and the upper body swung up as the legs descend.

(b) Backward. A backward dislocate is executed by kicking obliquely backward and upward, and extending the arms to side horizontal.



Full description of movements appears on opposite page.

EXERCISES ON RINGS—*Continued.*

No. 7. Handstand between Rings. The commencement of movement leading to this position is shown in No. 3, from which point the hips and back are first raised, then the legs and the arms straightened. It should be noted that some little assistance in steadying oneself may be secured by pressing the outsides of the forearms against the upper circle of the rings.

One will require considerable practice upon the rings before he will attain the proficiency necessary for this feat, though anyone who can do a handstand on the floor or parallel bars will very quickly acquire it on the rings. This illustration shows what may be accomplished by faithful application to gymnastics.

No. 8. Position known as the Crucifix or Human Cross. The best method of approaching or attempting it is first to press up to cross hand position, arms at sides, and then gradually to allow the arms to move outward from the sides, lowering the body until reaching the position illustrated, with arms outstretched on a level with shoulders. This requires a powerful development of those muscles of the sides, back and chest which depress the arm. Only the exceptional gymnast can accomplish it. It offers a good goal for the aspiring and ambitious youth to work for.

No. 9. Position for Forward Cut-off, either single, double or straddle. The cut-off requires that the legs be first raised and swung back of the rings. A single right cut-off, which is not very difficult, would mean letting go of the right ring so that the right leg may pass through the opening thus made, the right hand again catching the ring instantly following the downward swing of the leg, the left leg returning downward between the rings. This photograph shows pupil about to execute forward straddle cut-off (with both legs simultaneously), catching both rings again quickly before the body has had time to fall. Inward cut-offs made with legs swung up outside. Backward cut-offs are also made, outward and inward.



Full description of movements appears on opposite page.

PARALLEL BARS.

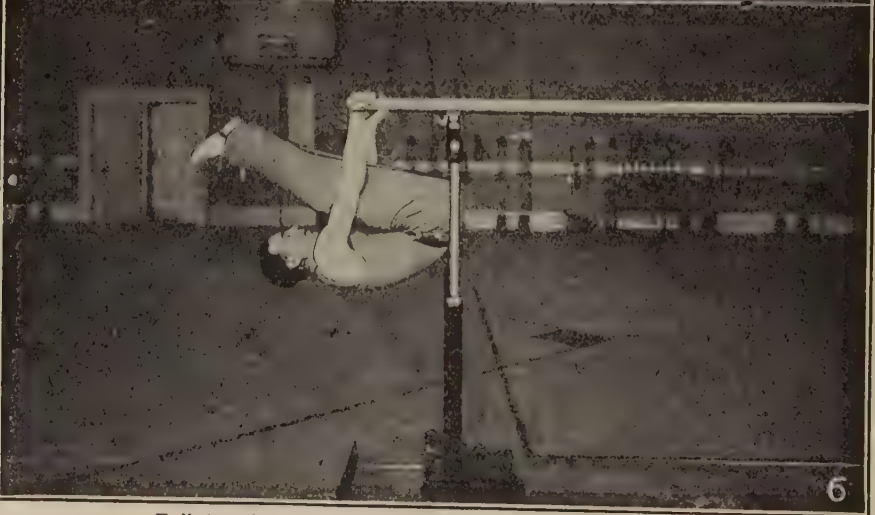
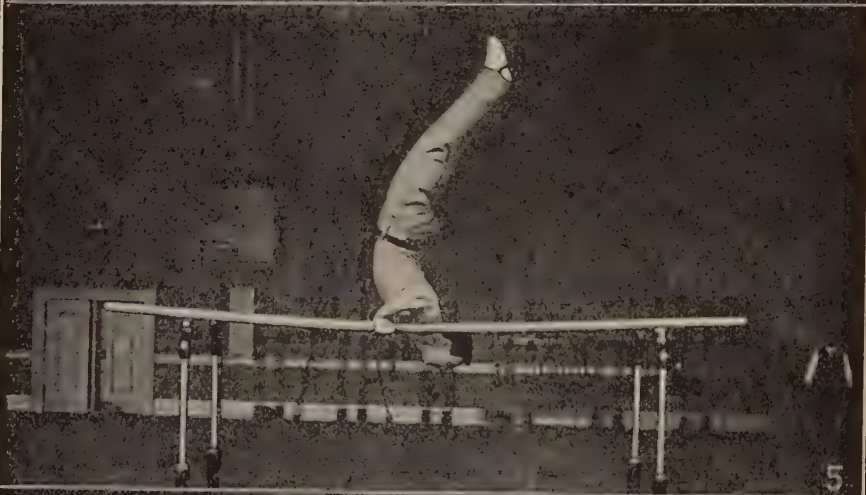
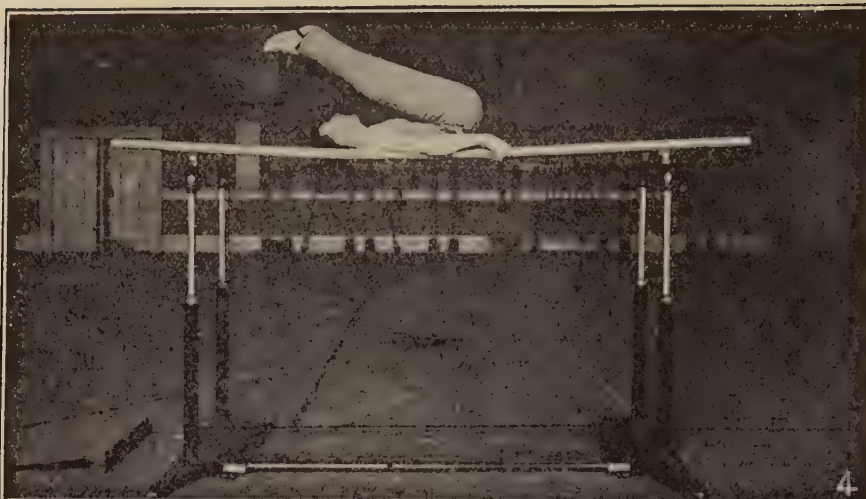
No. 1. Front Arms Rest, a general first position, from which most moves are executed. It is usually reached by approaching from the end, taking hold of the ends of the bars and reaching position with a little jump. From this position one can move over the bars by walking on the hands, alternate steps with each, or by little hops, jumping with both hands together.

No 2. Bent Arm Hang. Walk from rear end to far end in this position. Also execute the following swing, starting from position in No. 1. First swing legs up forward, straddle both bars close to hands, bring hands forward to bars and then, bending elbows dip shoulders down almost to level of bars; release legs and swing down and forward and upward, straightening arms and raising up as legs come up between the bars for another straddle. Repeat until reaching far end of bars, and then reverse the movement, swinging backward but always dipping the arms and then straightening at the end of swing. A vigorous exercise is provided by simply lowering the body from straight arms rest to this position of bent arm hang, then pushing up again, developing the triceps and muscles of the sides, under arms, especially latissimus dorsi.

No. 3. Front Leaning Rest, hands on one bar, legs across other. A general position from which a number of movements may be started.

(a) Leg circles may be executed from this position. Bring right leg with a sweep over the bar, down between the parallels and up over the same bar to the left of the left leg, passing under same and back to position. Same with left leg.

(b) Vault from bars may be executed by throwing weight forward on hands and swinging both legs together to one side and over both bars. Squat, Stretch or Straddle and other movements may be executed from this position.



Full description of movements appears on opposite page.

PARALLEL BARS—*Continued.*

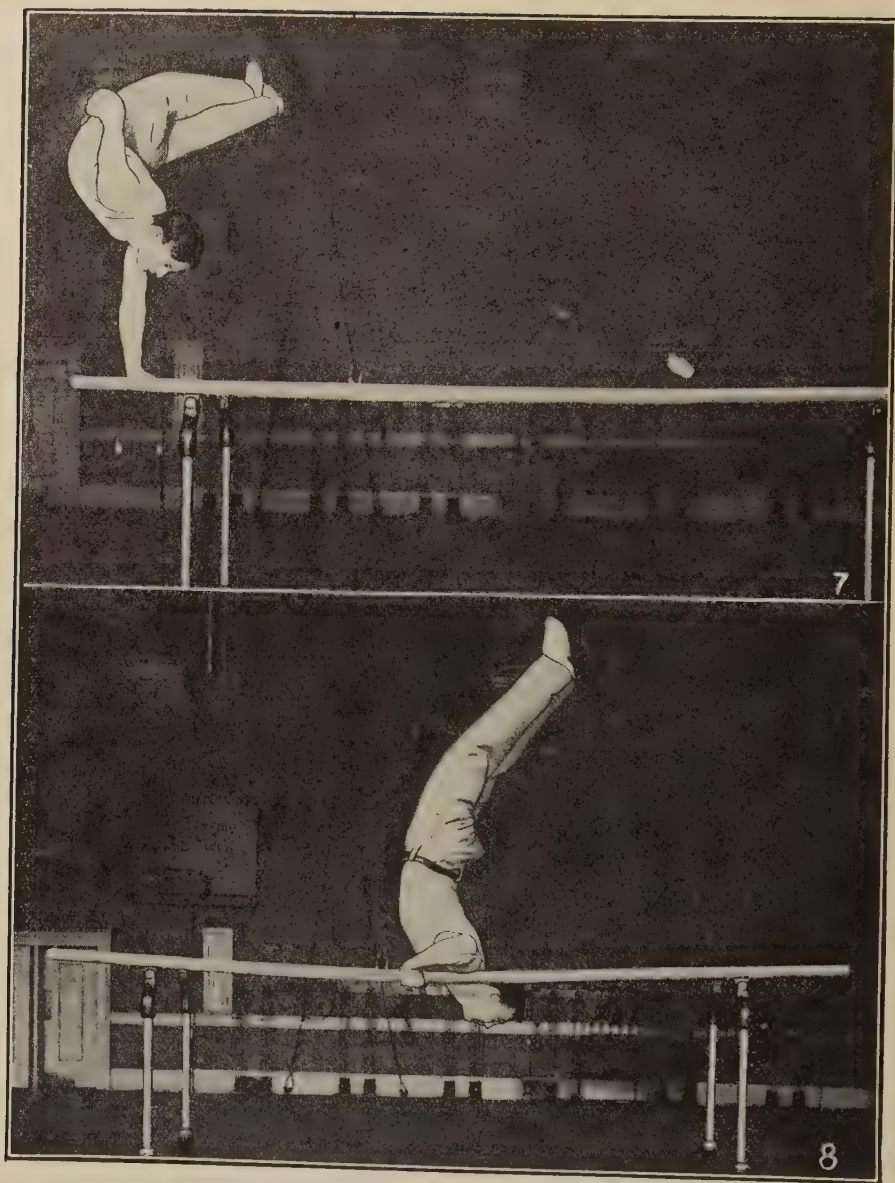
No. 4. Still Kip. This position, ready for still kip, may be reached by standing between bars, arms outstretched forward, and grasping bars with elbows over them, then swinging up to position shown in illustration, hips just above level of bars and legs flexed up and back against body. From this position swing legs obliquely upward and forward, and with arms stiff, swing to upright position with body. The body must rise with the momentum just as the legs descend, and unless this is accomplished at the right moment it cannot be done. This position, in readiness for still kip, may also be reached from the backward shoulder roll, described in connection with next illustration.

No. 5. Shoulder Stand, from which several movements may be executed.

(a) Forward or Backward Shoulder Roll. A roll on the shoulders may be easily executed if one makes it a special point to see that his upper arms, from shoulders to elbows, are extended horizontally to the sides, and remain so during the roll. In rolling backward the hands will change position, taking a new hold on the bar, and the body passing through a position similar to that shown in No. 4, ready for still kip. In rolling forward the hands will retain their position and body will come to position of arm hang, somewhat similar to that shown in No. 2.

(b) Position for pushing up to Hand Stand.

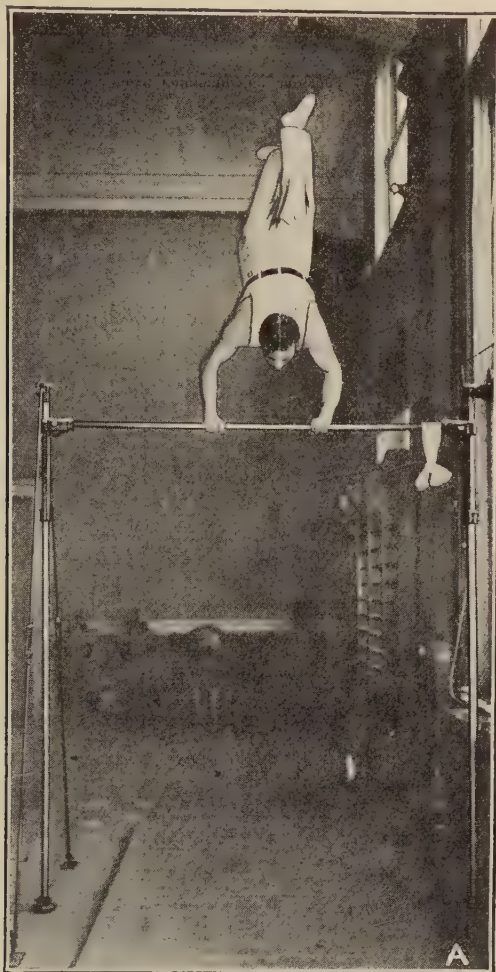
No. 6. Drop Kip Between Bars. This is a much more difficult kip than that shown in No. 4, but the principle is the same, and after mastering the other it will not take long to get this. Hanging in the position shown, vigorously swing legs obliquely forward and upward, bring the hips up to the position of the hands, and as the legs descend keep the hips in this position with arms rigid, swing upper body up to vertical position.



PARALLEL BARS—*Continued.*

No. 7. Execution of a One Hand Stand. This is performed at one end so that if balance is lost a drop to the floor is easy, either to the side or forward. It is reached from a Two Hand Stand, slowly shifting the weight to one side until balanced on that hand. This illustration is introduced not as a suggestion for beginners, but to show the possibilities of Parallel Bar Work.

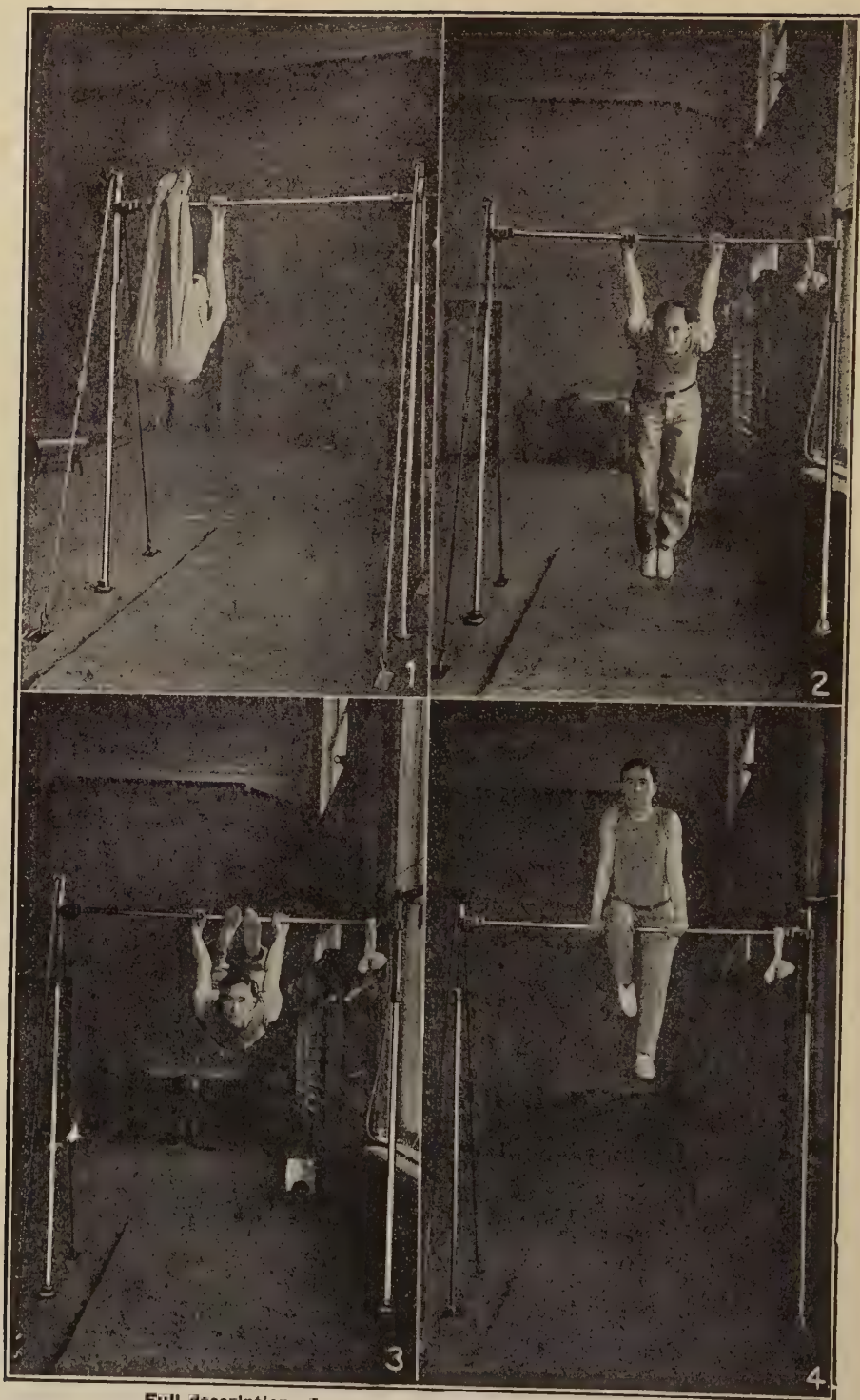
No. 8. Drop to Side from Shoulder Stand, a picturesque method of leaving the bars. Slowly shifting weight to right shoulder, push up and over with left arm until the body swings outward, pivoting on the right shoulder and landing upon the feet. Same to the left side.



HORIZONTAL BAR.

PHOTO A. Hand Stand on Bar. This is very difficult because of the fine balancing sense required. One who is not adept at hand stands on the floor can scarcely hope to attain it. This is the position from which to start the "Giant" Swing or Circle, swinging backward, and all the way round, again and again, hanging only by the hands and touching no other part of the body to the bar at any time.

This feat and others illustrated on the pages following may at first seem difficult or impossible, but they are illustrated to show what one may work up to by faithful application, and what he may look forward to. It needs hardly be said that nearly all of the apparatus work suggested here applies to the needs of women as well as to men. Women are strong and robust, or the contrary, according to their efforts and habits.



Full description of movements appears on opposite page.

HORIZONTAL BAR.

No. 1. (a) Front Hang from which the kip swing can be executed. Flex the arms, bring feet to the bar and kick obliquely upward and forward, arching the back on the rear swing coming up on the bar with arms straight.

(b) Forward Draw. By drawing the legs over the bar and upward to front rest position, the head swinging up as the legs swing down.

(c) A Spur Kip can be executed from this position by flexing the thighs and extending them forcibly and pulling down on the arms.

(d) From Front Rest on bar drop back to position illustrated, arching the back, and dismount—known as short under swing.

(e) Front Hang, with head down, by extending legs upward in front of the bar, head down. This is simply the front rest position inverted.

(f) Back Hang, head down, is just the reverse or opposite of front hang, head down. Pass feet between arms and back of bar, pushing up until body is straight. Knee hang is reached from this position.

No. 2. (a) Back Hang. Legs and thighs flexed, pass legs back between arms and lower to position illustrated.

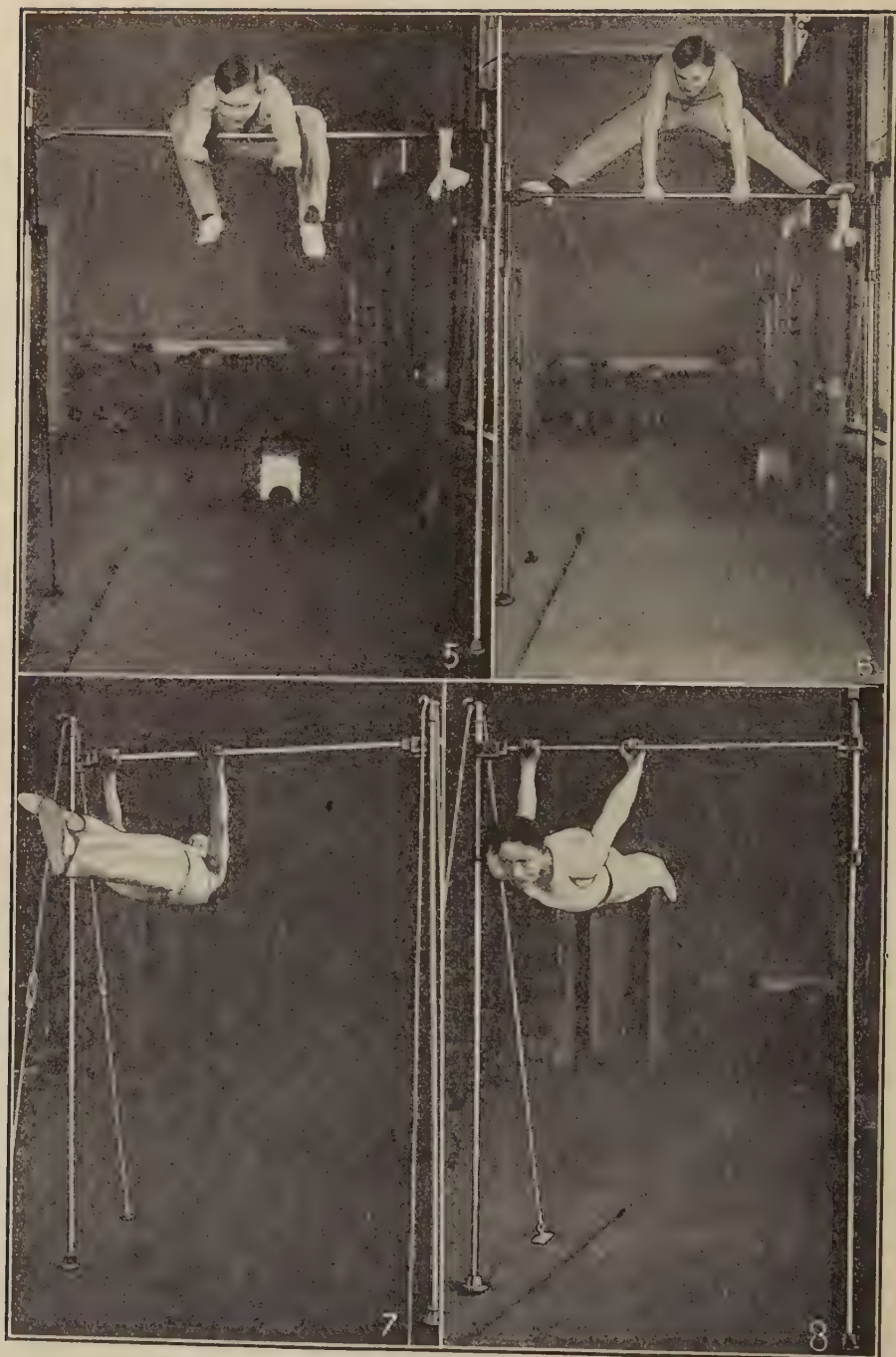
(b) From *a*, grasp either hand and dropping hold by the other turn either left or right to the hand hang, and repeat to the opposite side.

No. 3. Bird's Nest. From position in No. 1, hook toes against bar, pass knees and hips forward between arms, arching back, to position illustrated.

No. 4. Knee Mount. Place one knee over, swing down with other leg, and body swings up on bar, with either left or right leg, on the outside or inside of either hand.

(a) From this position swing forward in a circle, round and round as many times as desired and

(b) Backward in a circle, in a similar manner.



Full description of movements appears on opposite page.

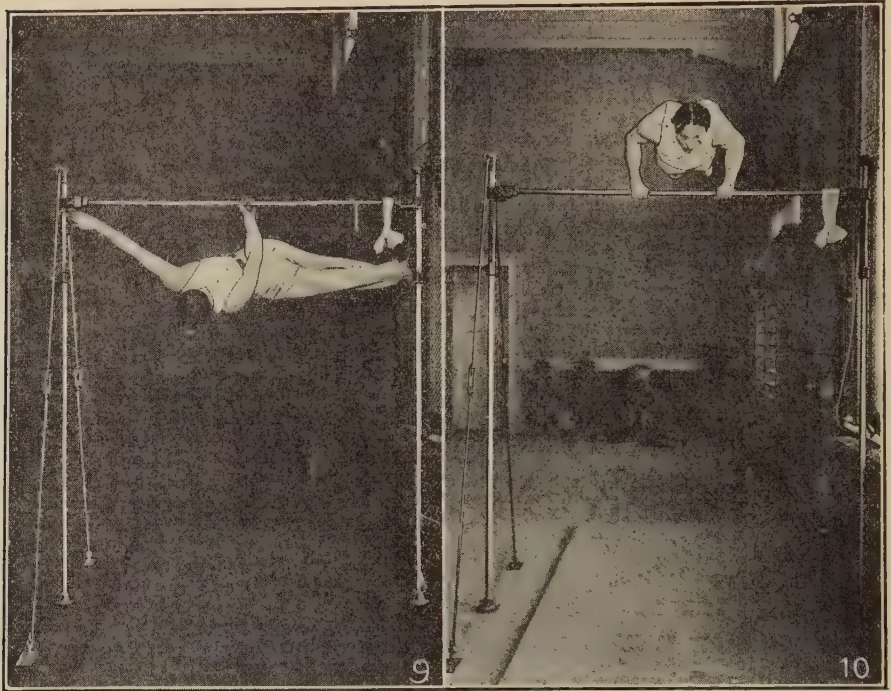
HORIZONTAL BAR—*Continued.*

No. 5. Beginning at hook circle or swing from both knees. First sitting erect with both legs across bar, let legs slide back until hooked on bar at knees, thrusting arms far forward until ready, then swing. A striking and interesting dismount is accomplished, when sitting on the bar, by dropping backward, hooking and swinging by the knees until the body has swung around to the limit of its momentum and is facing the floor, at that moment disengaging the legs and dropping neatly upon the feet on the floor.

No. 6. Position of hand and foot, circle backward. It is understood that gymnasium shoes of sufficient flexibility of sole are worn for this purpose, so that the feet may maintain their position without slipping. In this, as in all the other swings, it is necessary to give an extra little pull at just the right time when going upward from each swing, in order to get all the way up and over the point of equilibrium. Toe and heel circles are executed from substantially the same position, the heel circles backward and hooking the heel, the toe circles forward and hooking the toes.

No. 7. Front Lever, a gymnastic feat requiring great strength of muscles of back, sides and chest. From position of front hang, with head down (see description of "e" in No. 1), and with body straight and rigid, gradually lower feet until body assumes the horizontal position illustrated, then stopping and holding this position for a few moments.

No. 8. Back Lever, another exercise requiring great muscular vigor, and especially of the chest muscles. It is just the reverse of the Front Lever. From back hang, head down (see "f," No. 1), lower body, rigid and straight to horizontal and hold for a few moments.



HORIZONTAL BAR—*Continued.*

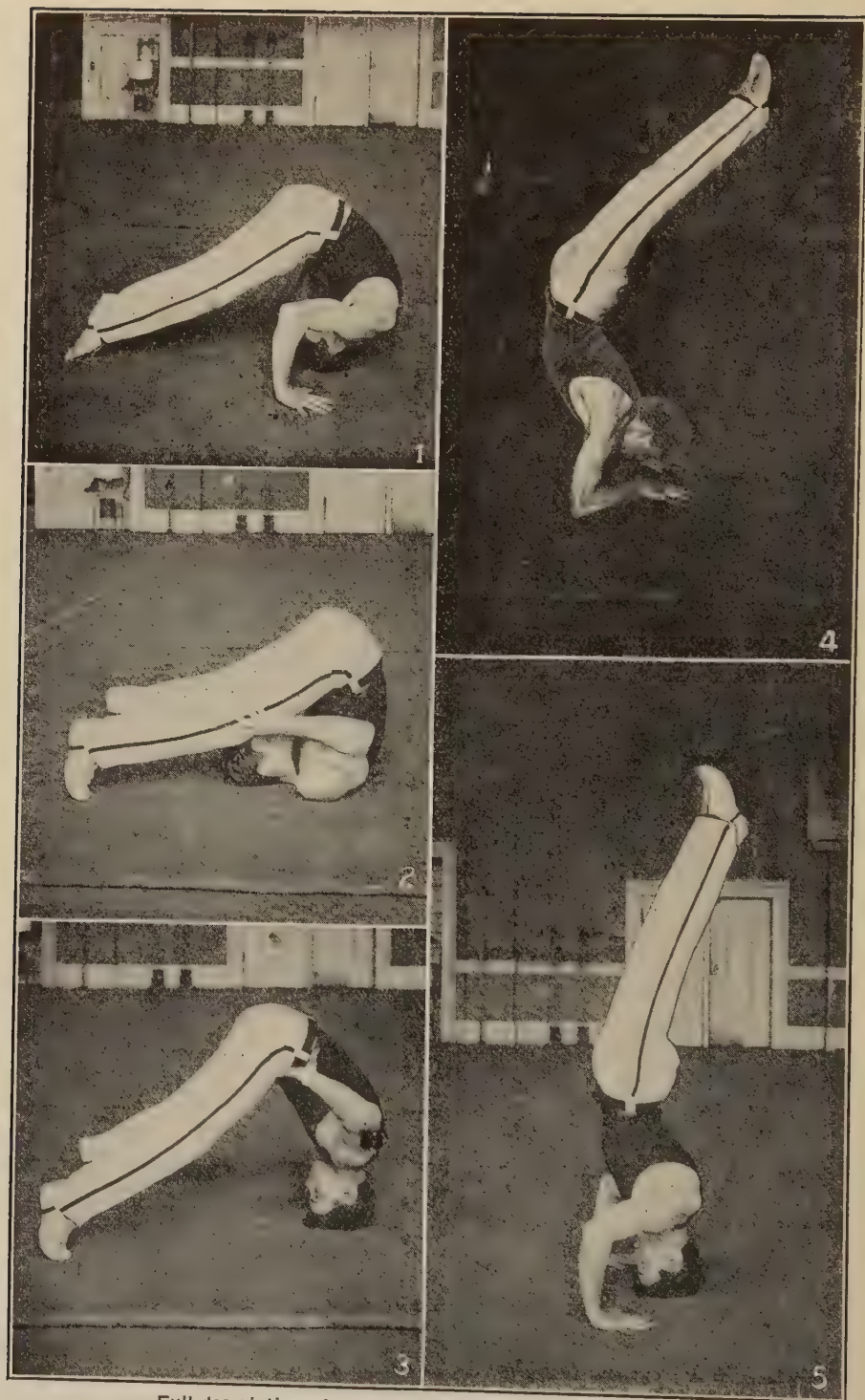
No. 9. Side Lever. This logically follows the front and back levers, and is really a variation of the back lever. Being done with one arm, it is naturally much more difficult. The back lever must first be executed, after which pupil lets go with one hand and maintains the horizontal position while hanging only with the other arm. In doing this, the active arm should be held as tightly to the side as possible and the other side of the body turned upward as much as possible. This should be practiced alternately with each arm.

No. 10. Elbow Lever. The elbow lever differs from front, back and side levers in that the body is supported above the bar instead of being suspended underneath it, though the horizontal position is the essential requirement. Position is arrived at from the front rest, bringing head forward and raising body until it is horizontally balanced on a level with the elbows. This is very easy, with palms down and elbows braced under the hips at each side, but when executed properly with elbows free of the sides, it is an exercise to test one's strength.

TUMBLING.

As stated on a foregoing page, tumbling affords a most enjoyable means of attaining a symmetrical and strong, supple body. While some of the more complicated and intricate phases of tumbling are only mastered as the result of years of painstaking effort, there are many simple movements which can be learned by any man or woman who has the energy and persistence essential to gain the skill involved in their execution.

Among the most simple and better known of tumbling movements are the hand-spring and the somersault. Almost any active young man or woman can learn to perform the hand-spring in a comparatively short time. Neither will the backward somersault be found such an extremely difficult movement as it seems at first trial. The forward somersault is often thought more difficult to learn and to execute than the backward, but it is simple enough when once you have learned it. It should best be practiced over water or a heavy cushion. Do not attempt it without a little run for momentum, in the beginning. Starting with this little run, of five or six steps, jump from both feet at the same time and execute the somersault by quickly doubling up and then straightening out again. To do this with certainty you should practice the same quick catching hold of the legs just below the knees as in the backward somersault, catching hold for an instant only, then letting go and straightening out again. This is all there is to the forward somersault, though be sure to get a good jump up into the air. It may seem curious that the same method of doubling up and catching hold of the lower legs should work in both the forward and backward somersaults, but in the former there is only the forward impetus, while in the latter this doubling up follows the first backward impetus.



Full description of movements appears on opposite page.

TUMBLING—*Continued.*

No. 1. (a) Forward Draw; head and hands on mat; legs and feet extended; draw body forward.

(b) Forward Roll. Similar to *a*, except that the legs and thighs are flexed in rolling forward, so that after rolling over the back one is able to stand up on his feet.

(c) Backward Roll. Similar to *b*, except that it is the reverse. As the body rolls back on the neck and head the hands should again be placed on the floor to assist.

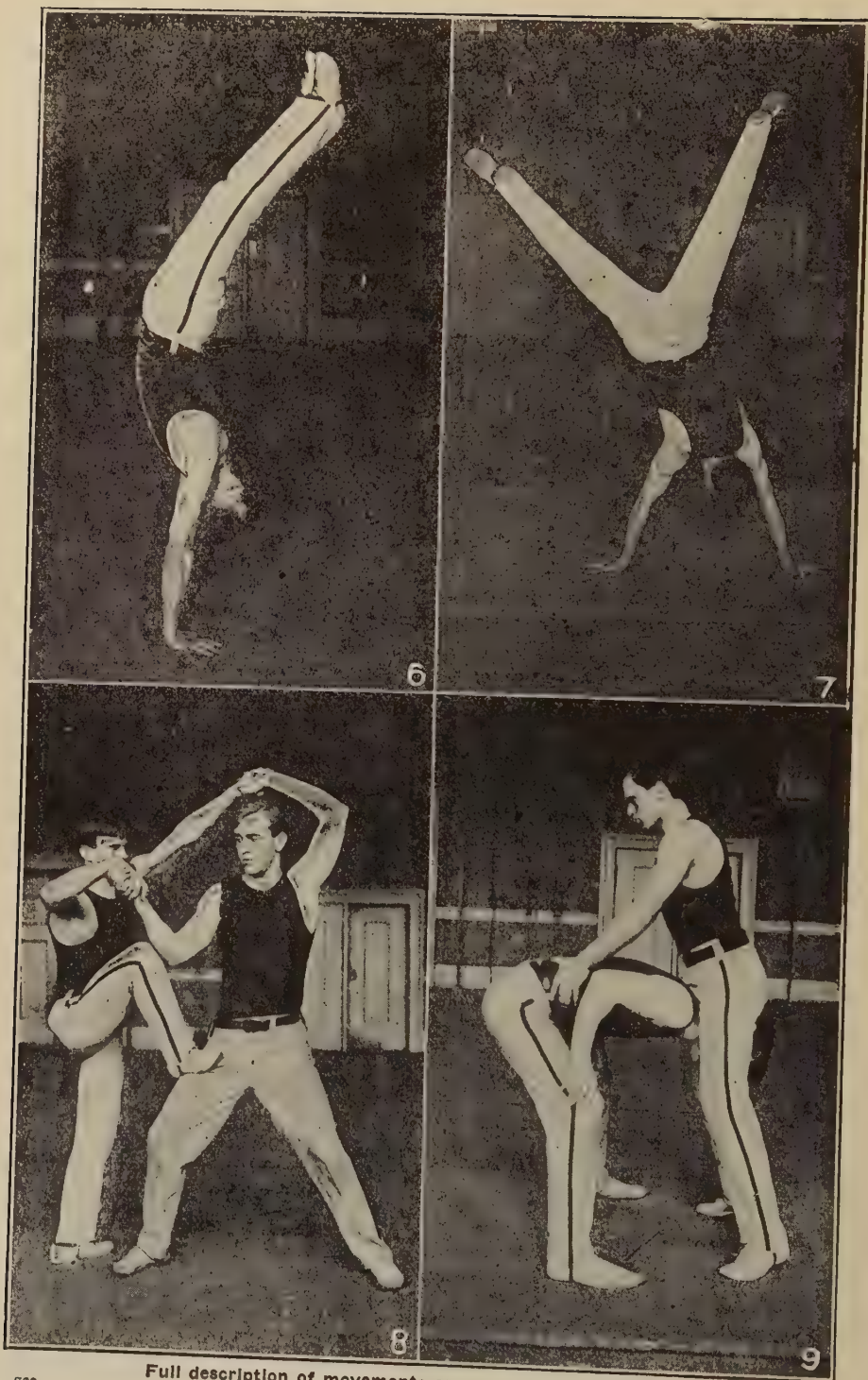
(d) A Dive for height and distance, can be taken from either a stand or a run. The above rolls should be mastered thoroughly before attempting this. The hands should reach the floor first, breaking the force of the descent, with the head doubled under well so that the body will land on the back of the neck and shoulders, with extended legs parallel with floor, and rolling as in *b*.

No. 2. Neck Snap, without assistance of hands. Hands are placed against knees to help give a smart, quick snap. With legs in this position they are quickly thrown back, the feet then doubled under the hips to get them well under, and the upper body hitched upward with the impetus so that it is balanced on the feet. If this is difficult, place hands as in No. 1, pushing off smartly with the hands when making the snap, which makes it easy.

No. 3. Head Snap, with or without assistance of hands. Photograph shows it without hands, but it should be mastered with hands first, held in position shown in No. 1 and No. 5. From position in No. 3, push off with the legs and throw them over smartly as in the neck snap, coming up on your feet. A quick, vigorous arching of the back is necessary in all of these snaps, or springs, which makes the exercise valuable.

No. 4. Forearm Stand, a good exercise in preparation for the difficulties of hand stands, and one which helps greatly in developing the sense of balance in the inverted position. Can be used in combination with the head and hand stand, following, placing head on the floor and raising elbows.

No. 5. Hand and Head Stand. Another good balancing exercise, but also a particularly good position from which to do the head snap. This will require a quick and energetic arching of the back, at the same time pushing up smartly with the hands.



Full description of movements appears on opposite page.

TUMBLING—*Continued.*

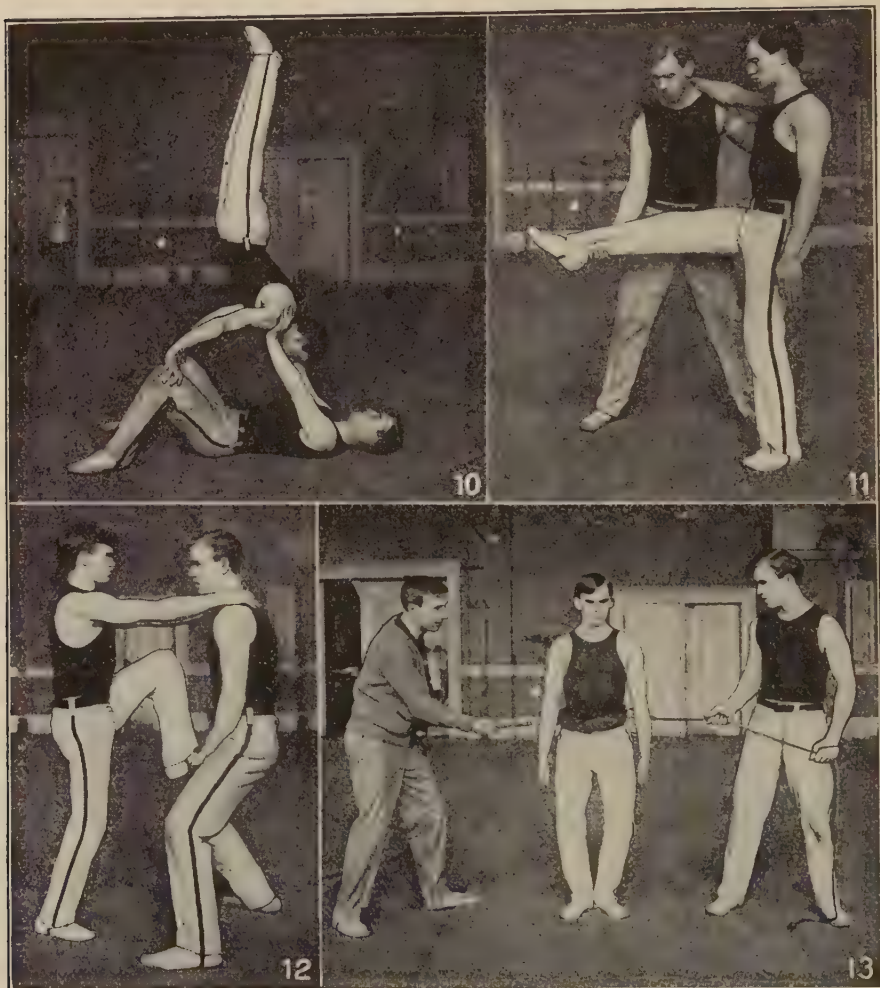
No. 6. (a) Hand Stand on Floor. The best way to learn the sense of balance in this is to do it a couple of feet from a wall, so that if feet tip over too far you may correct the position readily. Hands and wrists are important in this. Walking on hands should be practiced.

(b) Hand-Spring. (Not illustrated.) Attempts to learn the hand-spring should first be made over some heavy padding or cushion. It should be learned early because it embodies so perfectly the principle of the flip or snap of the body in all snaps and flips. A slight run may be used at first, but not depended upon. After reaching the hand stand position in No. 6, the legs should be kicked over smartly and the back arched, following which instantaneously the upper body should be vigorously flexed forward, bringing about the upright position. This quick bending of the upper body at the right time is indispensable. The momentum of a run may carry one over on his back but cannot raise him up on his feet. This requires the "flip." It may help to bend the arms at elbows very slightly, pushing off with the arm when the "spring" is made, but this is not essential. When mastered, one can do a hand-spring just as well on one hand, with arm rigid. This should be mastered before attempting somersaults.

No. 7. Cart Wheel, a comparatively simple and easy exercise, but one with which the pupil should nevertheless take the greatest of pains to do correctly. Usually it is slighted and slurred over because it is easy. It should be learned turning to both right and left. It is a sideways movement, bending down to the right side, placing right hand on floor, following with left hand and the lifting of the feet, the left leg swinging over first and then followed by the right. After learning to do a single cart wheel well, practice on a series.

No. 8. Two High Mount, mounting on shoulders of under man. The latter has legs well apart and braced. With right hand in other's right, left in left, upper man steps with right foot upon other's right thigh, then steps over on left shoulder with left foot, right foot on right shoulder, and balance. To stand erect, under man may put his now loosened hands back of calves of upper man for support and balance. From this position, with hands in hands as in mounting, a forward hand-spring may be executed.

No. 9. Hand-spring forward with the assistance of thrower. Upper man, astride back of neck of under man, places hands on latter's hips, or a bit above hips. When ready, under man lifts up, giving the other momentum as he turns hand-spring off the former's hips.



TUMBLING—*Continued.*

No. 10. Head and Shoulder Balance. As will be seen, this requires two persons, and while comparatively easy, yet produces a pretty effect. The under man lies on his back with legs flexed at right angles at the knees, feet on the floor and as wide apart as the width of the shoulders. The upper man, approaching him from the foot, places his hands on the other's knees, leaning forward until his shoulders may rest against or upon the other's hands. Then raising his feet from the floor he comes up to a shoulder stand.

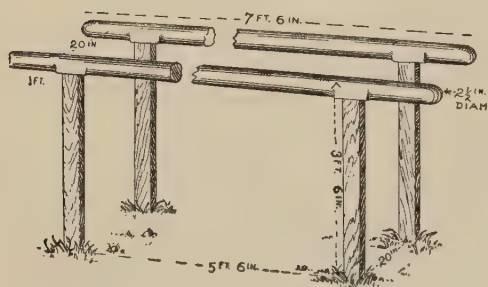
TUMBLING—*Continued.*

No. 11. Somersault backward, with assistance. With right leg extended horizontally in front, right arm is placed over and back of assistant's arm, so that there may be no interference. Assistant places right hand under heel or calf of the other's right leg, left hand upon his back. At the count of three, the somersault is executed, the assistant lifting hard on the right leg and helping to throw the other around to his feet, the latter jumping well up in the air with the other leg.

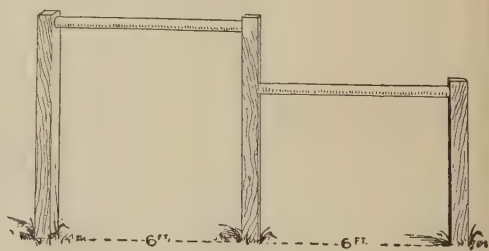
No. 12. Another form of backward somersault with assistance, this being probably more effective and satisfactory than that shown in No. 11. The assistant, with legs well apart and braced, knees somewhat bent in readiness for a lift, clasps fingers together tightly making a step upon which the other places one foot, in the manner shown in illustration. The latter also places hands upon assistant's shoulders, to press down and thus help in the lift. At the count of three the assistant lifts up powerfully and the somersault is executed.

No. 13. Somersaults backward and forward executed with the aid of the lunge strap and assistants. This is the most satisfactory way of learning a backward somersault, and should be practiced before attempting those shown in No. 11 and No. 12. A belt is worn with stout straps or ropes attached to each side and held by assistants, thus making a dangerous fall impossible. Secure and confident, therefore, the pupil is ready to master the details of the somersault. In the first place he should get a good lift, or jump upward, swinging the head and arms vigorously far backward. Instantly following this impetus he must energetically flex the body at the hips and stomach, drawing his thighs up and doubling up his knees, this serving to bring his feet up and over, and, this being accomplished, he must straighten out again so as to alight properly upon his feet. There is just one little rule to follow that will simplify the somersault and make it comparatively easy, and that is, after the first backward impetus, to grab hold of the lower legs, just below the knees, with the hands for an instant, and then to let go and straighten out. This grabbing hold just below the knees will make sure that you accomplish the necessary doubling up to get the feet up and over, and so long as you do this you can scarcely expect to have any trouble. But remember to let go again instantly. When you have good form, and can turn somersaults with your eyes shut, this snatching hold of the knees may not be necessary, but the beginner should not attempt to learn without it. If one is a good swimmer, he will do well to practice his back somersaults into the water, from a beam or other support scarcely above the level of the water.

APPARATUS AT HOME.—There are hundreds of thousands of young men who live in the country or in small towns who are interested in gymnastic exercises and apparatus work, but who naturally have no gymnasium within their reach. The purchase of apparatus for the home is a very expensive proposition for the private individual, indeed, so much so that it is practically an impossibility in the majority of cases. However, it is a simple matter to construct some home-made apparatus which will answer the purpose equally well, and at little expense. Furthermore, if there is a convenient space in the yard or orchard, it is ever so much better to have this apparatus outdoors, and in this way enjoy an advantage which is impossible for one who attends a gymnasium in the city. I am offering a few simple suggestions along this line.



Parallel bars for outdoor use, showing dimensions.

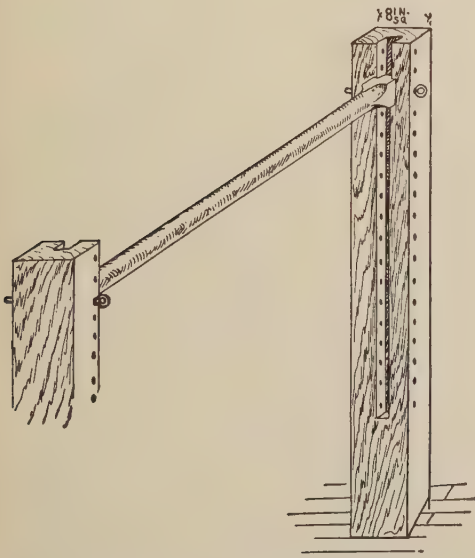


Outdoor horizontal bars.

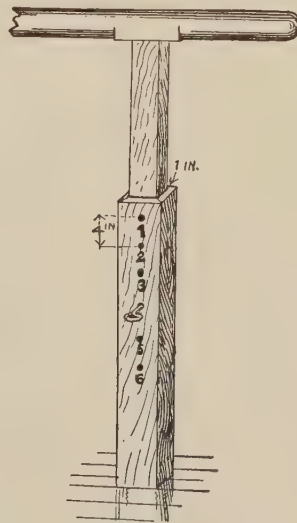
Parallel bars can be made in the following manner: If you intend to use them in the open air, four posts should be fixed in the ground perpendicularly, on the inside 18 or 20 inches apart at the ends, and about 5 feet 6 inches apart lengthwise. The posts should be about 3 feet 6 inches above the ground and made preferably of fir poles. Be careful to select bars that are free from knots. The bars should extend about a foot beyond the posts at each end, and you should therefore cut the two bars 7 feet 6 inches long. They should not be perfectly round but slightly flattened on both sides and about $2\frac{1}{2}$ inches at their smallest diameter. There should be a shoulder on those parts of the bars which rest on the posts to give additional strength to the bars. The ends should be slight-

ly rounded to fit the hollows of the hand. If the parallels are to be erected in a building, the posts can be made in a manner to allow the bars to be lifted higher, if required, according to the height that may be desired by the performer. If you wish to increase the height in this manner, a case should be made for each post to allow a two-inch square pillar to slide up and down therein. The case could be made of wood about an inch in thickness, according to the strength of the wood used. Holes must be bored through both pillar and post, into which an iron pin is placed to keep the bar at the required height.

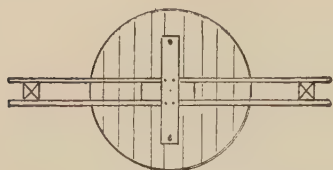
To make a horizontal bar for outdoor use, you should secure three posts which can be fixed in the ground, one lower than the other two. The posts should be about six feet apart, the bar to be fixed to each as shown in the illustration. The bar, if made of wood, should be about one-fourth of an inch more in diameter than the parallel bars. If iron bars be used, of course, they can be much smaller though a wooden bar is best. In making horizontal bars for indoor use, two posts about 8 inches square can be fixed tight in the floor. A groove about 6 feet long should be cut through each post to about 18 or 20



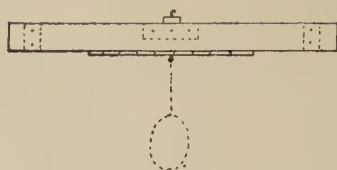
Indoor horizontal bar, showing how it should be made to be adjustable in height.



Showing one of the supports of indoor parallel bars, indicating how they can be made adjustable.



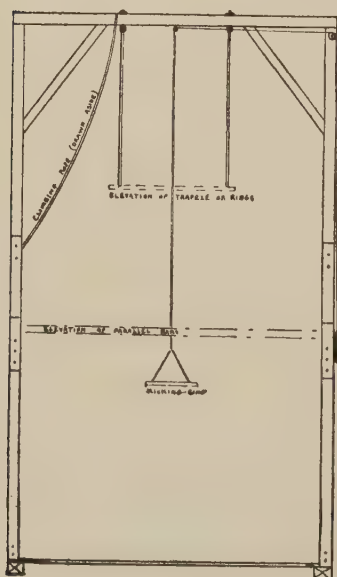
Top view of punching bag platform.



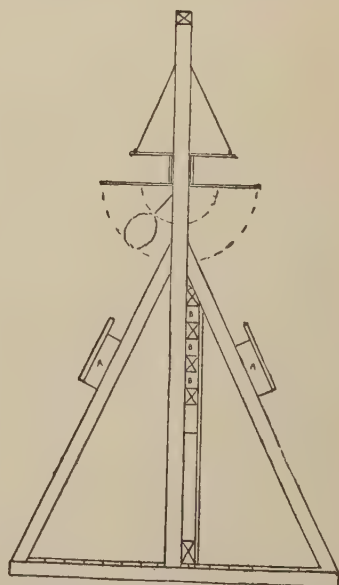
Side view of punching bag platform.

inches from the floor. About 14 or 16 holes should be bored through the posts within the length of the groove for an iron pin to pass through. The object of this iron pin is to place the bar at a proper height. A glance at the illustration will give one a much clearer idea than can be secured from my description. The bar can be the same size as required for outdoor use, but should have a small shoulder at each end to rest firmly against each post. As will be noted, the bar can then be lifted to any height required.

Following is an ingenious plan for what may be termed a "Combination Gymnasium," suited to one having limited space at his disposal, and including several forms of apparatus in the one structure. The suggestion and plans were given me by

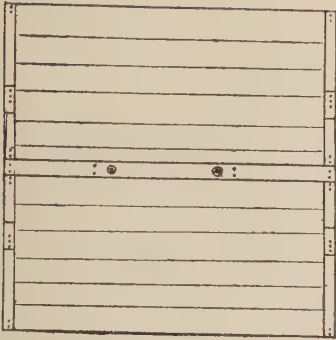


Front view.



Side view, showing bag platform in position. A, cleats for parallel bars. B, holes for horizontal bar.

A complete and inexpensive open-air "gym."



Showing floor plan, view from above.

Mr. J. W. Seaver, and I am giving his description of it in his own words:

"There being no gymnasium within reach, I resolved to build something to meet my needs, which resulted in what I now call 'my complete open-air gym.' The material used was about 100 feet of 2x3 scantling and 60 feet of common one-inch thick boards, which cost very little. I erected what resembles a frame com-

monly used for swings in our public parks; except that under one brace, which is rather higher than common, is arranged space for a horizontal bar, adjustable to three heights; and on the outside of braces are cleats in which my parallel bars rest. Thus in one piece of apparatus costing a trifle of money I have trapeze, swinging rings, horizontal bar, parallel bars, kicking ring (adjustable), climbing rope, and the children have a swing.

"As an afterthought, I made a platform for a punching bag, which can be removed when not in use. All this apparatus is adjustable to any height, except the parallel bars; in fact, is used daily by my wife as well as myself. A glance at the drawings shown in the article will enable anyone to construct a similar piece of apparatus. The frame is put together with log screws, the ropes for trapeze have loops spliced in lower end to fit over trapeze or rings, holding same securely. The high kick is arranged with weight and a scale is marked on outside of upright. For bars I used 2x3 oak planed down, except at ends, to fit hands. The circle for bag was made of three-quarter-inch smooth boards firmly nailed to two one-inch boards six inches wide which fitted the uprights and is raised or lowered by cord used for high kick. This platform complete weighs about forty pounds and can easily be removed when not in use.

"After several months' constant use the apparatus gives as perfect satisfaction as the first day on which it was erected."



Procure two large tin cans

To make dumb-bells, procure two large tin cans, and cut out bottom. Next make four circular pieces of wood large enough to be placed firmly in the can at either end. Into the center of each of these cut a hole as shown in illustration. Procure also a hardwood bar the length of the ordinary dumb-bell.

Now procure some cement. Mix one part cement with two parts of sand. Add water until soft, but retaining a degree of firmness. Fill cans with this cement, covering top and bottom with the circle pieces of wood. Insert wooden rod. Run in wedge at the ends of cans to keep piece of wood in place. Before rod is placed in cans it would be well to run several nails into it. This will make it hold firmer in the cement, and it will not be apt to slide out after the cement is dry. The second dumb-



Finished dumb-bells after cans have been removed and edges rounded by file.



Make four circular pieces of wood. Cut hole in center of each. Procure hard wood bar the length of the ordinary dumb-bell.

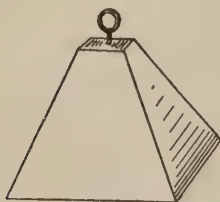


Cans filled with cement and with bar attached.

bell is made in the same fashion. Let entire apparatus stand for about four or five days, or until cement is perfectly dry. Then pieces of wood and tin can be removed leaving you the dumb-bells made of cement. They can be smoothed off with a

file and made to appear as shown in illustration. A coat of good paint would also help to improve the appearance of the dumb-bells.

A lifting weight can be made in the same manner. The directions are so simple that the illustration showing one made of cement will give anyone a clear idea how to make it.



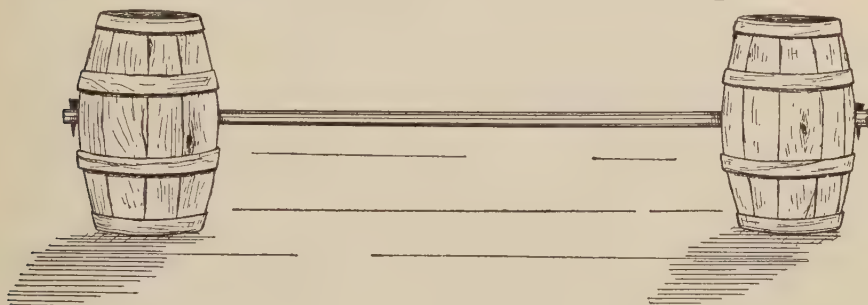
A lifting weight made in the same manner as dumb-bells.

A *bar-bell* may be made by using larger cans or pieces of stove pipe of any length required, ac-



Showing small bar-bell in completed form.

cording to the size and weight desired. One should not attempt to use a bar-bell without a careful study of the instructions for weight-lifting given in another chapter.



Showing another simple method of making a bar-bell, using a couple of very small kegs. These may be filled with sand or any other material, the weight increased or decreased as desired. Using sand bags of known weight will be convenient for this purpose.

FLATIRONS.—The old-fashioned flatiron may often be used advantageously as a form of gymnastic apparatus. The work of ironing may itself be regarded as an exercise, but it is not ideal for this purpose on account of its stiffening tendencies and lack of action. A pair of flatirons may be used in the same manner that one uses a pair of dumb-bells, however, and in many cases they will be found more effective in executing the same movements. I would especially recommend their use in this way if one is desirous of strengthening the hands, wrist, forearm and grip generally.

FLEXING EXERCISES.—See *Tensing Exercises*.

MEDICINE BALL.—The medicine ball is a large, soft ball, covered with leather and packed with any suitable padding, not unlike a substantial but perfectly round pillow, from a foot to a foot and a half in diameter, and weighing eight, ten or twelve pounds, and sometimes more. The purpose of the ball is simply to throw and to catch, there being no special organized game. The ball is heavy enough to afford splendid exercise in the mere throwing and catching, with either one

arm or both arms, and this throwing and catching is interesting enough to make it attractive. The curious name given it is not due to any "medicine" contained in the ball or associated with it in any way, but to the fact of its early recognition as a means of promoting health and strength. In that day, the word "medicine" was associated with the idea of improving health.

By various methods of throwing, nearly all parts of the body may be exercised in the use of the medicine ball, first throwing underhand, overhand, and sideways with each separate hand, throwing by a straight pushout from chest, with both hands from between the legs, both hands from behind the head and backward, both over head and between the legs. It is altogether a very satisfying form of exercise. A bag of beans will answer just about as well for the purpose, if one does not wish to spend the money necessary for a well made medicine ball.

MENTAL REQUIREMENTS OF EXERCISE.—See *Concentration*.

MIDDLE AGE AND EXERCISE.—See *Old Age and Exercise*.

MUSCLE BINDING.—Those who are enthusiastic upon the subject of physical culture are not infrequently favored with a warning that they are likely to become "muscle-bound," this coming usually from dyspeptic-looking persons who do not know the meaning of the term. Somewhere they have heard the phrase, and guessing that it describes a condition to be disapproved of, do not hesitate to cry it aloud at every opportunity. In some cases they gather a vague idea that it means such an excess of muscle that one is unable to move the various parts of the body.

However, one need have no fear of any such difficulty if his methods of training are at all rational, and it may be said just at the outset that no mere bulk of muscle will interfere with one's most free and easy movement of every part, provided it is properly developed. It is only the improper and restricted use of the muscles, and not the amount of development, that can cause a "muscle-bound" condition. The term has reference to a shortening of the muscles which makes im-

possible complete extension and flexing of the members concerned. This condition is the result of exercises which call for greatly restricted movements, rather than the fullest possible extensions and flexions. It does not matter how heavy or massive one's muscular development, he will not be muscle-bound if he has faithfully followed this necessity for complete movements through all of his training.

Old-fashioned weight lifters have taught us to guard against muscle-binding by their example. Their work with the weights involved great stress upon the muscles, and while they developed the necessary bulk and power, they did not move the weights any further than necessary. Their muscles were shortened accordingly, and people began to offer a supposed argument against physical culture because it made people muscle-bound. However, it was only the mistaken method, for even weight lifting may be practiced so that it will not have this result, as will be seen in another place. There is no cause for alarm on this point.

OLD AGE AND EXERCISE.—There are many who fancy that while exercise is of benefit to young people, yet it is not suitable for those in advanced years. This is the greatest mistake, for it is the lack of exercise in most cases which is the cause of that physical decrepitude which is so commonly associated with age. Activity is the law of life, and this is no less true in age than in youth, though there are some modifications to be made in the manner of exercise. Just so soon as one settles down to "be old," or in other words, to stagnate, mentally or physically, just so soon do his powers atrophy and decline, and it does not matter whether the process starts in at the age of forty or eighty. The only way to retain youth up to the last is to maintain the healthful conditions and activities of youth.

We should remember that old age is a matter of physical condition rather than of years, and we often meet people who are as young at seventy or eighty years as others are at half that age.

Speaking briefly, age means a loss of elasticity, especially in the cartilages and in the walls of the blood vessels. A great

deal is said about the hardening of the arteries, but this is a matter which may be largely controlled by the diet, the exercise and other matters affecting the health and nutrition of the body. Since we know that circulation depends upon this elasticity of the blood vessels, next to the essential pumping of the heart, the importance of keeping the arteries in good condition, and for the sake of this, the general health, will be obvious.

Nearly all ordinary exercises suitable for all-round development can be practiced with benefit by those who are passing through their advanced years, except that in some cases they would better be performed more slowly. Owing to the gradual loss of elasticity in the arteries, it is not wise for those who are very old to attempt violent or very rapid exercises. As a rule, those which call for less speed or activity but more endurance are well suited. The requirements of children are just the opposite, for they can profit by lively games with only moderate demands upon their endurance. There are many cases in which old men have shown themselves capable of better endurance records in old age than in youth, outside of the more strenuous pastimes. Walking is an ideal exercise for the old.

As for those in middle age, little needs to be said except that they should really be included in the classification of young people. In a healthy condition, the man or woman of middle age should really look forward to one or two score years of youthful activity and strength before entering upon any decline in vigor or health, and even then should endeavor so far as possible to continue with the conditions and activities of youth. If unaccustomed to physical exercise, the man of middle age will find himself rather awkward and stiff, but if he will take up faithful and persistent physical training he will find that all of this will disappear in a few months and he will again enjoy the activity and strength of his early maturity. He may take the regular exercises suitable for young people, with any variations that may be necessary for his individual peculiarities.

RELAXING EXERCISES.--In previous chapters I have referred to the necessity for complete relaxation as a means of securing perfect sleep. The possibility and the practice of relaxation outside of sleep, however, are elements of health-building which should be emphasized. There are thousands of people who go about in their waking hours in a state of nervous tension and who even sleep with their hands tightly gripping the bed clothes as though something desperate would happen if they let go of themselves. This condition of tenseness involves a terrible

waste of energy, and in some cases, if not overcome, is alone sufficient to prevent any material gain in strength and vitality.

The power to relax will give one greater efficiency and power in any endeavor or occupation, not merely because of the saving of energy that would otherwise be wasted, but because of the better control which one may thereby enjoy both over himself and the external affairs with which he has to deal. Well-seasoned athletes know and appreciate this keenly. It is an indispensable feature of good boxing, for in a contest one cannot afford to squander his strength through unnecessary tenseness or to have his muscles so tied up in this way that he cannot act instantaneously when an opening presents



Standing without tenseness, raise one arm at a time to the level of the head, and after a moment relax the muscles, letting it drop loose and limp to the side, where it should swing once or twice if it is properly relaxed.

itself. If it is necessary for him to relax his stiffened and contracted muscles and then to contract them again in order to strike, he will be too late. The boxer who has not yet learned the lesson of relaxation is hopelessly handicapped.

And it is so in other matters, not merely in athletics, but in every phase of life. If you have the least tendency towards nervousness or excitability, or if you have not yet acquired the power to relax each and every part of the body absolutely at will, then you should immediately set about the study and practice of relaxation until you have secured such control over yourself. If it means nothing to you just now, there may come a time before long when it will mean everything to you. And it will help you to get control of your body from the standpoint of contracting the muscles and exerting your strength as well. Before long you will be able to relax utterly without the assistance of the special movements that I have suggested.

It is true that this tenseness arises primarily from a mental or nervous condition, and if one can only bring about a relaxation of the mind and nerves, the rest of the body will relax as well. However, the mind is so much accustomed to acting



Walk slowly and carelessly across the floor with the entire upper body relaxed, somewhat after the manner of one relaxed through intoxication. The head should droop even more than in this illustration, or until the chin rests upon chest.

through the body that by thinking in terms of relaxed muscles, as it were, and by special movements which assist in this relaxation of the muscles, one is able to bring about the desired relaxation of the mind. It is for this purpose that I offer suggestions on relaxation elsewhere in this work.

It may help to point out that a heavily intoxicated man is a good picture of muscular relaxation, involuntary and undesirable as it may be. Some forms of partial paralysis, involving a similar relaxation of the body, present a spectacle so similar that police officers are usually coached carefully in order that they may distinguish the difference. I mention this because it will help you to relax the body if you will imitate the manner and the appearance of a drunken man, simply letting every part of the body hang limp and seemingly lifeless.

Of course, if you relax utterly you will even cease to stand, just as does the man completely drunk when he collapses on the sidewalk. It would be well to practice this frequently when you are not nervous and have no need of it, in

order that you may the better be able to do it when you have real occasion. It may all seem very undignified and silly, and you may feel that you are placing yourself on a par with a circus comedian, but it will prove an effective means of getting away from your tenseness.

The other suggestions for raising the arms and legs one at a time and letting drop loosely will be equally as valuable for relieving nervousness in the daytime as for wooing the absolute



Bending forward, let one arm at a time hang down loosely, swinging as though absolutely lifeless. All stiffness and tenseness must be avoided. It should be perfectly limp and relaxed. Alternate with each arm.

relaxation of perfect sleep. In the case of the arms you should raise one slowly to the level of the shoulders, hold it there a moment, and then "let go," permitting it to drop limply and without life. If you really do this successfully the arm will probably swing loosely back and forth two or three times, without restraint or guidance, apparently without life. It has not been deemed necessary to illustrate these relaxation movements because they can be made just as clear by this brief description. Each leg, raised nearly to the level of the hip, will show a similar tendency to swing lifelessly at the side after both the control and the contraction of the muscles have ceased. Another fairly good movement for the purpose consists in holding the hands out in front and then shaking them limply and loosely, letting them flop or fly freely up and down from the wrist.

Possibly these movements in an erect position may not be



Bending far forward from the hips, let the arms swing loosely and the entire upper body hang limp and relaxed. After standing a few moments in this position, shake the fingers loosely and then stand erect.

so easy or satisfactory as exercises in a reclining attitude, in which one may dispense with even the moderate muscular contraction required for standing, relaxing utterly. Lying on the back, on a bed, one leg may be raised to an angle of forty-five to sixty degrees, and then allowed to drop freely, with a sense of weariness and of relaxing the entire body simultaneously. If it is properly limp it may bounce a bit once or twice. The same may be done with both legs at a time, and with the arms. Often it is well also to raise head and shoulders two or three inches, then dropping

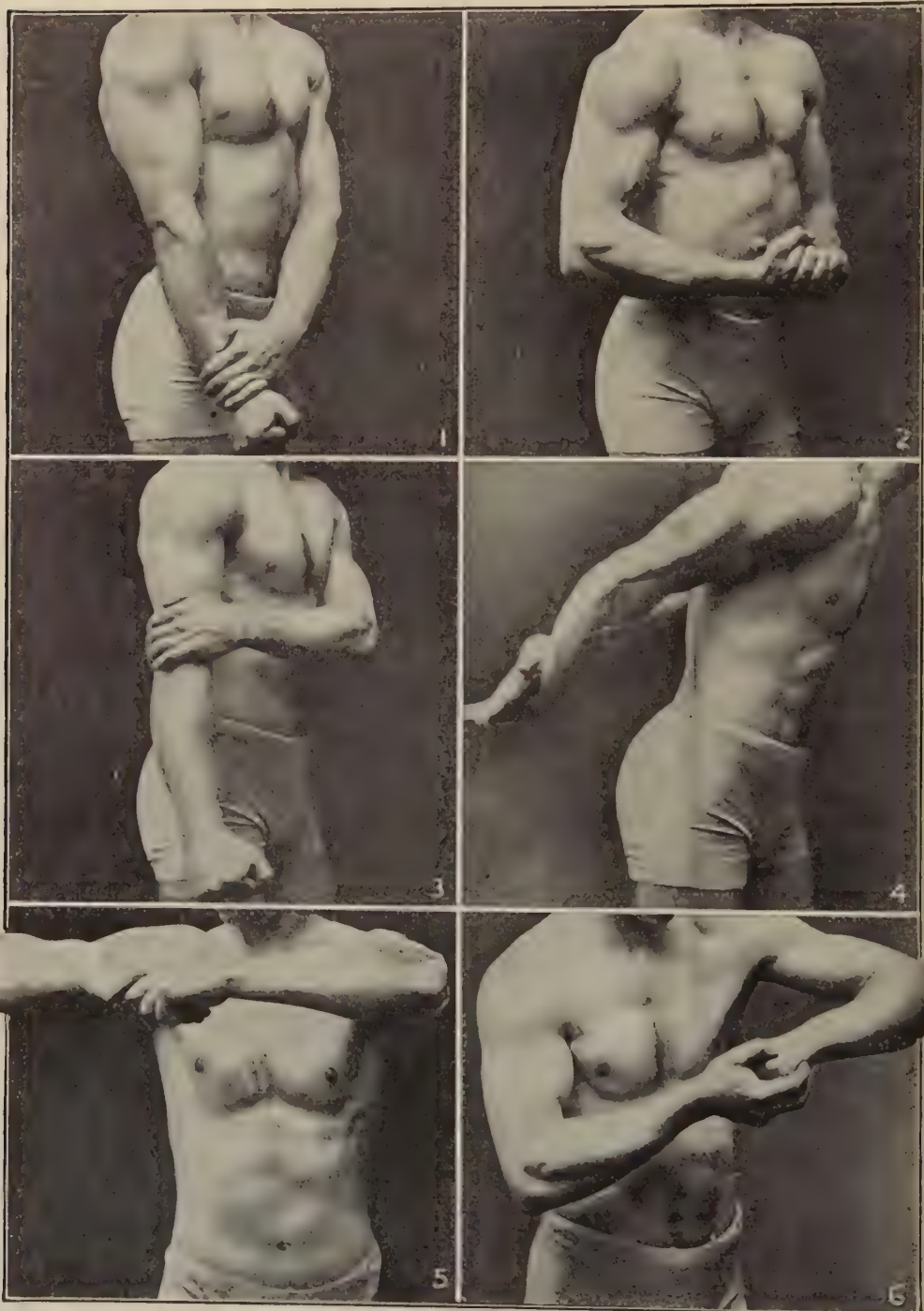
back with a sense of utter abandon. It is often a good plan, lying or sitting down, to try to imagine that your body is as light as a feather, and that you are floating in the air.

RESISTANCE EXERCISES.—In the broader sense of the term, practically all exercises are “resistance” exercises, with the possible exception of some of the very lighter forms of calisthenics. Most exercises depend for their effectiveness upon offering some form of resistance to the action of the muscles concerned, whether this resistance consist of external weights, elastic cords, wire springs, or the weight of the body itself. The greater the resistance, the greater the effort to overcome it and the greater the muscular power developed thereby.

But more specifically, the term, “resistance exercises,” may be applied to a form of exercise in which the muscles of one part of the body offer resistance to those of another part. They may be recommended because of their convenience in not requiring any apparatus, and because they offer a means of developing a truly powerful degree of strength.

In a sense, the so-called *tensing exercises*, discussed and described elsewhere, are a form of resisting exercise, but the word, “tensing,” is so descriptive and fits them so well that they may be best distinguished in that way. These *resisting* exercises have to do with movements, made as full and complete as possible, whereas the *tensing* exercises are commonly executed with little or no motion, simply producing muscular rigidity of the part of the body affected. In these resisting exercises there is less opportunity for any undesirable interference with the circulation, for the reason that the one muscle or set of muscles is usually opposed by others in a remote part of the body, rather than by other neighboring muscles which would make the entire part hard and stiff. (See *Tensing*.)

I am offering only a few suggestions in the way of resisting exercises here, as illustrating the general scheme by which the student can devise exercises that will develop every part of the body, powerfully if he chooses, but at any rate symmetrically and perfectly. Every one should have a good working knowledge of muscular anatomy, and with this knowledge he should



Examples of Resisting Exercises.

EXAMPLES OF RESISTING EXERCISES.

No. 1. For biceps, flexing muscles of arm: Place left hand over right wrist in position illustrated, then, with right elbow stationary at side, flex right arm until right hand is brought up to shoulder, resisting the movement with left arm. Alternate with other arm.

No. 2. For extensor muscles of arm: With hands placed as shown, and starting first from position in front of neck or upper chest, gradually and forcibly press down with the left arm, resisting with right, until straight and down in front of body. Alternate with other arm, hands reversed. It is to be noted that there is nearly but not quite as much exercise for the resisting muscles as for those active in directing the movement.

No. 3. For lateral deltoid muscles: Placing left hand outside of right elbow, raise the right arm outward and upward to the side, resisting with the left arm. Alternate on the left side with left arm.

No. 4. Crossing hands behind the back, press backward and outward with one hand while resisting with the other. Alternate by reversing hands. For shoulder muscles and deltoids, also pectoralis.

No. 5. Clasping or hooking hands, and starting from position in front of right shoulder, pull with left arm and resist with right, pulling hands over to position in front of left shoulder. Then reverse. For shoulder muscles.

No. 6. Placing fist of one hand in palm of the other, as illustrated, and starting from position in front of left shoulder, push left hand across front of chest, resisting with right hand. Reverse the movement, alternating. For pectoralis (upper chest) muscles.

be able to invent or arrange whole systems of exercise for all parts of the body, along the lines of any method or scheme of training suggested. The application of this principle of resistance is especially valuable in strengthening the fingers, the wrists, the neck and any parts not well provided for in the ordinary systems of all-around exercise.

It is important to remember the necessity, in all such exercises, of carrying each movement as far as possible in both directions, both in the flexion and extension of the active member. In extending the right arm, for instance, against the resistance of the left arm, the movement should begin with the right arm flexed as tightly as possible, and continued until it is extended to its limit, or absolutely straight. Naturally, the greatest power in this case will be exerted through the extensor muscles of the right arm, otherwise there would be no movement. These may be termed the *active* muscles in this instance, and the biceps of the left arm regarded as the *resisting* muscle.

As in other forms of exercise, due attention should be paid to the essentials of relaxation, the use of all parts of the body daily and other requirements. A most important factor here is the concentration of the mind, for without this the exercise would be nothing. The vigor of the exercise will naturally depend absolutely upon the degree or intensity of mental application.

SPEED.—To acquire quickness of movement requires only that one practice exercises or games calling for speed. It does not matter how much other healthful exercise one may take, it will not interfere with the development of speed provided one undergoes a little special training each day for the purpose. It has often been supposed that a heavy development of muscle means that one is slow, but this is not true. Some of the biggest and most powerful men are as quick as a cat in their movements, though it is also true that some of them are slow. It is partly a matter of special training for quickness, but probably even more a matter of build and development. The man with very heavy bones is not likely to have speed, unless he has a remarkable development. Many small men have speed

because they are lightly built. Most large men are not sufficiently developed to possess a marked degree of speed. Perhaps I should say that it is a matter of the proportionate weight of bone and muscular energy. The man of small bones may be quick with a muscular structure apparently moderate in size, while the big man of fairly heavy bones may also have speed if he is powerful enough, from a muscular standpoint.

Continual slow and heavy work will make one slow, even though he may be strong as a Hercules. This is often true of weight lifters. But some weight lifters who persist in speed exercises and games enjoy a very fair degree of quickness with all their strength. Boxing, hand-ball, fencing, sprinting and other exercises calling for quickness of movement may be relied upon to develop speed.

STIFFNESS AND SORENESS AFTER EXERCISE.—This is the result of suddenly taking a lot of exercise when one has been unaccustomed to do so, or, when accustomed to a certain amount of exercise each day, of taking an unusual lot of it all at once, or of taking exercises entirely different from those which one is used to, and thereby placing heavy demands upon muscles unused to them. The symptoms are caused by the unusually large amount of toxic elements, which irritate the nerves.

One who takes up systematic exercise after long inactivity may expect to experience a little trouble in this direction, but it is not serious and will pass away in two or three days, not to return except in similar circumstances. It is really better, however, to take only a little exercise at first and gradually to increase the amount so that there will be no inconvenience of this kind.

Massage is valuable as a means of relief, since it forces the venous blood out of the tissues, makes way for the fresh arterial blood, and thus powerfully accelerates the circulation locally, or wherever desired. Massage, however, is not always convenient, and the best common treatment is the application of hot water. This also will arouse a most active circulation and will accomplish wonders in overcoming both the stiffness and lameness. Hot water and rubbing combined is recommended.

STRETCHING EXERCISES.—Stretching is a form of exercise practiced instinctively not only by mankind, but by most other animals, after a prolonged period of sleep or of inactivity. Outside of our own experience we are especially familiar with the stretching antics of cats and dogs. It seems to be Nature's



A natural stretching exercise, one which is often practiced instinctively and involuntarily. The stretching of some muscles involves the vigorous contraction of others, though in most stretching exercises this means the contraction of extensor muscles. In this case the stomach, chest and front neck muscles are stretched, the back muscles contracted.

impulsive way of trying to make up for too many hours of muscular idleness. But if a few moments of stretching is found to be gratifying and pleasurable, and is known to be of physiological benefit, we can accomplish much more good by extending the exercise into minutes, and consciously, thoroughly stretching every part of the body.

The act of stretching is an involuntary and instinctive contraction of the extensor muscles of the various parts of the body, offering marked relief especially when the limbs or any parts have been flexed or cramped for some time. The very fact that the contraction is instinctive, would indicate the constitutional value as well as the local benefit of the effort. I have just said that stretching is a contraction of the extensor muscles, but this stretching is often accompanied by a similarly instinctive contraction of many flexor muscles. For in-

stance, after rising high on the toes, stretching with the large extensor muscles of the backs of the calves, one may stand on the heels and stretch the toes upward, flexing as far as possible. Or, after stretching the arms and finger tips out as far as possible, one may feel the impulse to clench the fists tightly and double the arms up above the shoulders, throwing the head back and pulling the elbows back as far as possible.

In every case, however, these stretching contractions are confined to either the extensor or flexor muscles at any one time, and are therefore to be distinguished from the so-called tensing or antagonistic exercises. In the tensing exercises there is not necessarily and not probably any complete extension or flexing of the part, while the extensor and flexor muscles contract at the same time, opposing each other and rendering the entire member rigid. In stretching, however, when the extensor muscles are contracted and the part extended to its possible limit, the flexor muscles are absolutely relaxed, and when the member is flexed to the utmost the extensor muscles are utterly relaxed. For this reason the use of stretching exercises can be recommended as infinitely superior to tensing methods, though the latter also are useful in some instances. In short, stretching fulfills the requirements of the ideal exercise in the way of alternating contraction and relaxation and in the completeness of the extension or flexion of the part, though lacking in the element of movement and in the use of the muscle through the full sweep of the various positions in which it acts. In straightening the arm, for instance, from a tightly flexed position, the triceps is brought into play continually from that position through all of the positions of the arm until it is fully extended. In stretching, the muscle is used vigorously only in the one position of the straightened arm.

Stretching, therefore, is not to be considered as a complete and adequate system of physical training in itself, but it is highly valuable for its physiological benefit and is to be recommended as supplementary or auxiliary to some other comprehensive method of exercise. For the most perfect condition

and development of the muscles, there should be movement, and movement at that throughout the full scope of the action possibilities of the muscles.

The proper time for taking stretching exercises is the time when you will most enjoy them, or in other words, whenever you are led to stretch through instinctive promptings, whether this be upon awakening from sleep or at any time of the day after sitting still for too long. It is scarcely necessary to illustrate a system of stretching positions, for anyone can devise such a system at will. Simply start to stretch and then keep on, stretching in every direction and in various positions. First rising on the toes, stretch finger tips high above the head, then stretch arms out to the sides and backward, then far out in front, then downward, then bending down, and with legs apart, stretch arms backward far between the legs; stretch body and head far to each side, then far forward and far backward, flex arms at shoulders and bring head and shoulders far back; stretch the legs, one at a time, far forward, sideways and backward; flex them tightly at the knees and then the thighs vigorously against the abdomen; then, if no other variations suggest themselves, go through the entire list over again.

SWEDISH MOVEMENTS.—This is the name given to a system of passive exercises for remedial purposes which were originally devised and used in Sweden, but which now are used more or less in progressive medical circles all over the world. I have called them passive exercises for the reason that in most cases the various parts of the body are moved by an attendant or, in some instances, by a machine, instead of the movement being performed by the active effort of the individual himself. By means of these movements the circulation may be locally increased in one part of the body, or decreased, as desired, thus relieving congestion and promoting the welfare of the body generally. Combined with massage, they are very effective in many cases, though as a general thing I consider that suitable active exercises, performed by the patient himself, are more valuable. This, however, has to do with the curative aspects of exercise and will be taken up in a later volume.

TENSING EXERCISES.—Tensing exercises consist of the voluntary contraction or “tensing” of the muscles of the body, without the use of apparatus or any form of external resistance, opposing muscles being used to counteract each other or to resist each other. They are sometimes called antagonistic exercises, and sometimes other fancy names. It is possible to execute them with a certain amount of movement, but usually they are executed without motion, and especially when equal force is exerted in the opposing muscles. In the case of the arm, for instance, the flexor muscles will be contracted in resistance to the extensor muscles, the result being a rigidity and hardening of the entire upper arm.

The principle of tensing as an exercise is employed very extensively among correspondence instructors in physical culture. It is well suited to a mail-order business of this kind because it gives the instructor an opportunity to advertise something different from ordinary gymnastics or exercises, something which is convenient, which can be made as vigorous or as mild as may suit any individual, and which permits of condensing a great deal of muscular effort into ten or fifteen minutes. Tensing exercises are used by a number of people at the present time.

Tensing has various advantages as a form of exercise, but has also certain drawbacks. The convenience of taking such exercise at any time, without removing the clothing, and even without being noticed when executing them in public, is well worth considering. At odd moments through the day, for instance when waiting for a train, while riding in a train or trolley, or even when walking along the street, one can voluntarily tense or “harden” the muscles of different parts of his body, thereby accelerating the circulation and building strength. Those who claim that they have no time for exercise may at least avail themselves of this method by putting it into practice when they are engaged in going or coming or in any occupation which does not require concentration of thought. The tensing of the muscles will require concentration.

The possibility of making the exercise as mild or as vigorous as desired has just been alluded to, but while moderate effort in tensing may prove satisfactory to many who are not yet very strong, yet as a general thing I would recommend free movements and other forms of exercise in such cases, the tensing principle being better suited to those who already have some measure of real strength and development. There is no doubt that by the practice of tensing one can harden his body and make it very rugged and vigorous, even though it is not an ideal form of exercise for the most perfect results.

Tensing also helps to give one a certain voluntary control over his muscles, for he learns to harden or tense one part or another as his mind may direct. Athletes and theatrical strong men who do poses in public acquire great control in this direction, and find that the vigorous contraction of the muscles for the purpose of making them stand out conspicuously under the calcium light is really a strenuous exercise. The practice of such poses before a mirror, causing the muscles of first one part and then another to be outlined as sharply as possible, may be commended as a part of one's general scheme of training or development.

The first and most important thing to be kept in mind in connection with the practice of tensing is the necessity for very frequent and complete relaxation. The proper plan is alternate tension and relaxation and very short intervals. One should avoid the "tetanizing" tendencies of tensing the muscles too long at a time, for reasons given in my remarks about *Exercise and Its Essentials* in this chapter. Voluntary and complete relaxation in frequent alternation with powerful tensing will help to give that muscular control which I have just referred to.

However, the exclusive use of tensing as a means of exercise is not to be recommended. The lack of action is one objection, though this may be largely overcome by introducing motion into the exercise, or in other words, contracting one muscle or set of muscles more vigorously than the opposing

muscle or muscles and thus allowing the former to move the affected member of the body slowly, against the less resistance of the other muscles. This is not perfect tensing, though it is better, but even then the movements are likely not to be so complete as they should be. Probably the greatest objection lies in the fact that in the very nature of the exercise the complementary muscles must necessarily oppose each other. Instead of getting control of each muscle individually, and training it to act independently, the muscles are trained to work against each other in a somewhat unnatural manner, to interfere with normal action.

The first and only purpose of muscle is motion. The ideal exercise is one which allows the muscle to fulfill this purpose without interference, moving either the body or some part of it, or some external object, and without any restriction except possibly the special resistance which it is intended to overcome in the course of the exercise. The purpose of the triceps, for instance, is not to interfere with the biceps, but merely to extend or straighten the arm. Under normal circumstances, when the triceps is called into action to extend the arm, the biceps is and should be utterly relaxed, and exercises which realize this condition are best. But after one has trained his muscles through a system of tensing only, his muscular control is likely to be so abnormal that when extending the arm his biceps also will contract, offering a large measure of resistance, and tending toward mere rigidity of the entire arm. When using certain muscles in the everyday affairs of life, he is likely to find himself hardening the complementary muscles and impeding his own actions, simply because he has so trained his muscles in his exercises. This more or less rigidity and hardness of the muscles seems to give one the sensation of strength and power, but it is somewhat misleading. If carried very far, this tensing exercise is inclined to make one slow, stiff and slightly muscle-bound.

Apart from this matter of imperfect control, there is the interference with the circulation which is involved in this

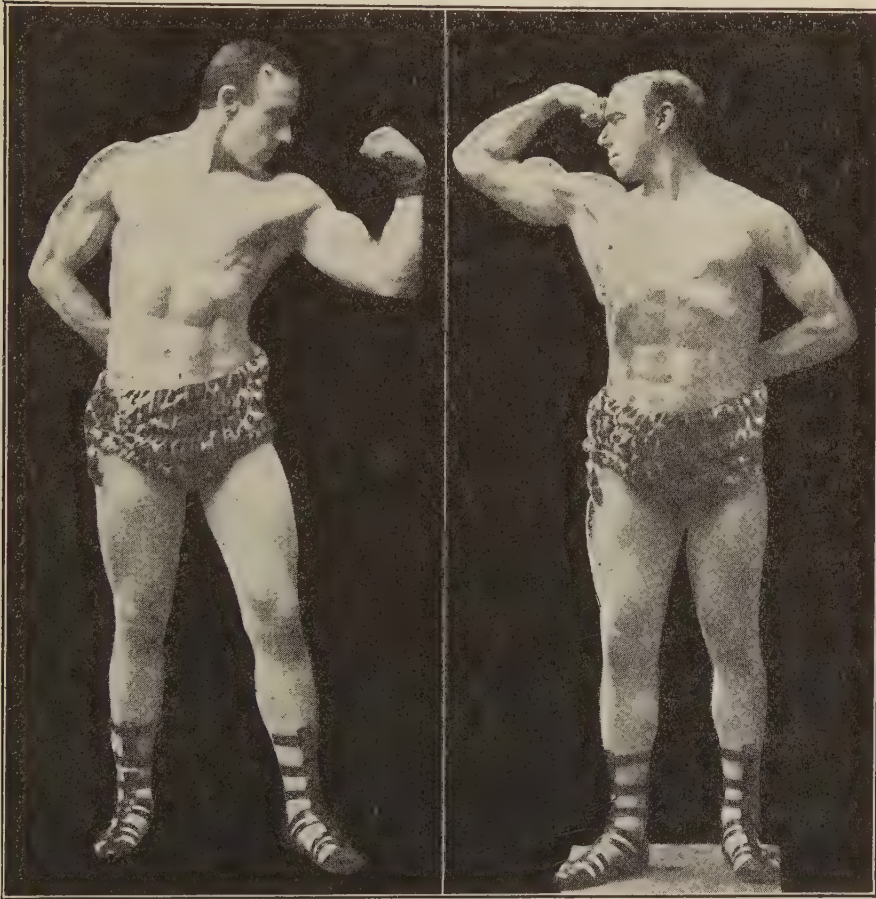
simultaneous and rigid contraction of all of the muscles of a part. If, as in normal movement, one set of muscles is completely relaxed while the opposing muscles are employed, the circulation is unrestricted through a great part of that member or section of the body. But in tensing there is more than twice the necessity for frequent alternations of relaxation than in the ordinary effort. In some resistance exercises where muscles in remote parts of the body operate against each other, as where certain muscles of the arm resist certain muscles of the leg, or one arm works against the other, this objection does not apply. (See *Resistance Exercises*.)

The question of mental concentration in tensing exercises is such an essential feature that much is made of it by those who advocate them. But from the standpoint of the voluntary and individual control of the muscles, and also from the standpoint of strength building, the apparent mental effort is misleading. For instead of all of the power of the mind and nervous system being concentrated upon one muscle or set of muscles, as should be the case for strength-building, it is necessarily divided between the opposing muscles. Furthermore, in providing the resistance to one muscle by equally contracting another, one consumes just twice as much nerve-force as is necessary to accomplish a given result with either muscle. With those who are vital and strong, this may be no objection, but for those who have no nerve energy to waste it should be an important matter.

I have here spoken of the complementary muscles as "opposing" muscles, but this is rather an improper terminology, and one to which only the invention of tensing or antagonistic exercises has given rise. These muscles are not really *opposing* muscles, for Nature never intended them to oppose each other, or to interfere with each other. They are simply intended to move the various parts of the body in opposite directions, and should be only referred to as intended for this purpose.

The claim is sometimes made that by this method one can supply within his own body a degree of resistance equal to that experienced in the lifting of a heavy weight, but with less tax

upon one's nervous energy and less strain upon the heart. This of course is not and cannot be true, for in the case of a like resistance there would be twice the tax upon the heart and nervous system in the tensing exercise. However, the less said about "strain upon the heart," the better, for it is an ambiguous phrase commonly used only for the purpose of frightening people to deter them from taking exercise, or in



Tensing poses by Albert Treloar, showing how exhibition poses may provide vigorous exercises. In these poses, not merely the arms are tensed, but the muscles of stomach and chest are sufficiently contracted to make them appear clearly outlined. In the first illustration the flexed wrist, at first turned outward, is gradually turned far inward, effectively showing a rolling movement of the biceps. In the second pose, the arm is flexed more completely, though not fully.

the case of the "mail-order" specialist, to prevent the prospective customer from taking any other exercise than his own. As long as one remains within the limits of pleasure and a rational moderation in exercise, there is no chance of trouble from a supposedly weak heart. In the majority of cases there is no danger here even when going to extremes in exercise, but of course such extremes are not to be commended.

Finally, summing up generally the advantages and disadvantages of tensing exercises, they may be recommended to a certain extent or as a part of one's physical training. When time is limited they will answer very well, and they are very convenient for warming up quickly for a bath.

As to their practice, it is unnecessary here to give complete specifications for all parts of the body. Aside from the suggestions illustrated, the student may modify or adapt any number of other movements or positions of the body, in the free movement exercises given in this work, applying the principle of tensing to these various parts and positions of the body in such a way that the entire body is influenced. The back muscles will oppose those of the abdomen and the region of the stomach, the sides will antagonize each other, the upper chest muscles those back of the shoulders, various muscles of the neck will work against each other and the same with the arms and legs. Having first made a careful study of the anatomy of the muscular system, any student will be able to devise a complete and thorough system of tensing that will comprise every part of the body.

Though we are illustrating only two or three tensing exercises, to help make clear the method of executing them, yet I am giving a complete system for employing all parts of the body in the following series of exercises. It will be seen that in this list as much movement as possible has been combined with the principle of tensing, thereby giving them the greatest possible value in their actual practice. In other words, they may be called "Flexing and Tensing Exercises."

They are intended for individual or private practice, but are also so arranged as to be available in class work. The *gen-*

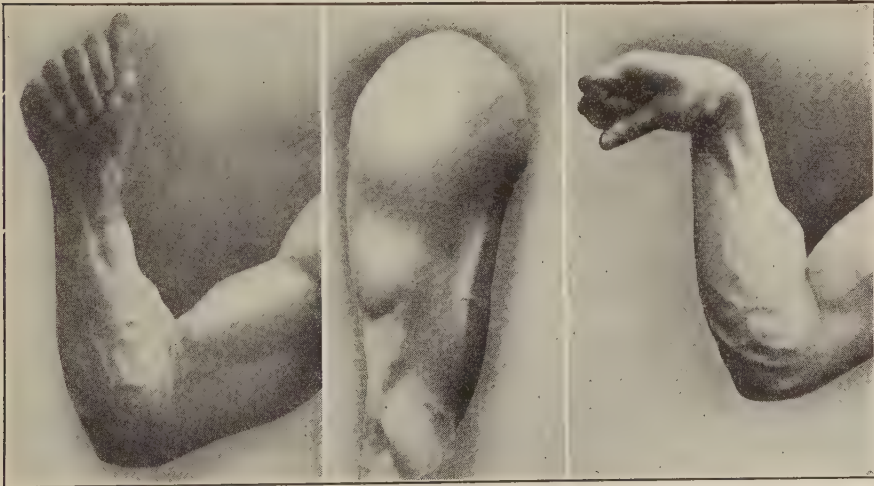
eral position for class work should be, *body erect, shoulders back, eyes straight to the front, chin in, arms hanging at sides.*

Exercise No. 1.—With elbows pressed hard against the sides of the body, slowly flex the arms, tensing the muscles of the upper arm vigorously, and tightly clenching the hands, thus compelling one set of muscle to resist the movement of another set. Count, 1-2-3-4.

Exercise No. 2.—Hold arms stretched out to the sides, repeat exercise of flexing arms as described above. Count, 1-2-3-4.

Exercise No. 3.—Clench hands tightly, with arms flexed, hands as near to shoulders as possible; then make several attempts to bring the hands still nearer to the shoulders without bending wrists. Count, 1-2.

Exercise No. 4.—With arms stretched down at sides, hands clenched, make several attempts to bring arms still farther down. Count, 1-2.



Three Examples of Tensing Exercises. In the first illustration arm is flexed at right angles, the entire arm tensed and hardened, and the flexor and extensor muscles contracted with equal vigor. While tensed in this way some movement may be introduced, flexing or extending the arm fully. Second illustration shows arm vigorously tensed but extended, the extensor muscles contracted with greater vigor. Third illustration shows a variation of the first, affecting muscles which turn the forearm. With wrist flexed inward, and all muscles tensed vigorously, turn hand outward to position illustrated.

Exercise No. 5.—Turn the head slowly from far to the right to far to the left, flexing all the muscles of the neck, and making one muscle resist the action of the other. Count, 1-2-3-4.

Exercise No. 6.—Bring the head far forward and then far backward, tensing all the muscles, and making one muscle resist the action of the other. Count, 1-2-3-4.

Exercise No. 7.—Bring the head over to the right, until it very nearly touches the right shoulder, then slowly bring the head over to the left shoulder, resisting the movement with all the muscles. Count, 1-2-3-4.

Exercise No. 8.—With the head as far back as possible make several attempts to bring it still farther back. Count, 1-2.

Exercise No. 9.—With the head as far forward as possible make several attempts to bring it still farther forward. Count, 1-2.

Exercise No. 10.—With the head turned as far to the right as possible make several attempts to bring it still farther to the right. Same exercise to the left. Count, 1-2.

Exercise No. 11.—With the shoulders held downward and backward, tense the arms vigorously, and then bring them slowly forward nearly on a level with the shoulders, then backward as far as possible. Count, 1-2-3-4.

Exercise No. 12.—With shoulders held immovable backward and downward, bring arms outward to the side as high as you can. Count, 1-2-3-4.

Exercise No. 13.—With shoulders held downward and backward, bring arms on level with shoulders, then make several attempts to bring them still higher. The arms can be brought but little higher than the shoulders, if the shoulders are held immovable, downward and backward. Count, 1-2.

Exercise No. 14.—With the shoulders held downward and backward, bring arms forward as high as you can, and then make several attempts to bring them still higher. The same exercise with the arms held as far backward and upward as possible. Count, 1-2.

Exercise No. 15.—With muscles of back and chest tightly tensed, slowly bring the shoulders far forward, then far backward. Count, 1-2-3-4.

Exercise No. 16.—Allow the shoulders to fall as far downward as possible, muscles tightly tensed; slowly bring the shoulders as high as you can. Count, 1-2-3-4.

Exercise No. 17.—Bring shoulders as far backward as you can, and then make several attempts to bring them still farther back. Same exercise with shoulders far forward. Count, 1-2.

Exercise No. 18.—Bring shoulders as far upward as you can, then make several attempts to bring them still farther up. Count, 1-2.

Exercise No. 19.—With shoulders hanging as far downward as possible, make several attempts to bring them still farther downward. Count, 1-2.

Exercise No. 20.—With the arms held far forward, elbows rigid, slowly bring arms across the body in front, right arm under the left arm. Same exercise with the left arm under the right arm. Alternate position of right and left arms. Count, 1-2-3-4.

Exercise No. 21.—Cross the arms as far as you can in front of face, elbows rigid, then try to force them still farther across. Same exercise with position reversed. Count, 1-2.

Exercise No. 22.—With arms held far out at sides on level with shoulders, elbows rigid, bring arms far backward, then far forward, touching the palms together. Count, 1-2-3-4.

Exercise No. 23.—With arms stretched far outward as in previous exercise, from far backward, try to bring arms still farther backward. Count, 1-2.

Exercise No. 24.—Cross arms in front of the abdomen on level with shoulders, right arm over the left; try to bring arms still farther over. Same exercise with position of arms reversed. Count, 1-2.

Exercise No. 25.—Slowly bend from far to the right to far to the left, tensing strongly the muscles of the waist and the back. Count, 1-2-3-4-5-6.

Exercise No. 26.—Slowly bend from far forward to far

backward, keeping the muscles of the waist line strongly tensed. Count, 1-2-3-4.

Exercise No. 27.—Bring body far over to the right, then try to bring body still farther over. Same exercise to the left. Count, 1-2.

Exercise No. 28.—Bring body far forward, and then try to bring it still farther forward. Same exercise with body backward. Count, 1-2.

Exercise No. 29.—Slowly twist body from far to the right with hips immovable to far to the left. Same exercise with left side. Count, 1-2-3-4-5-6.

Exercise No. 30.—Twist body far to the right, and make several attempts to twist it still further. Same exercise to the left. Count, 1-2.

THEORY OF EXERCISE.—See *Exercise and Its Essentials*.

TIME FOR EXERCISE.—The time of day selected for one's exercise is a matter that should be determined according to the hour at which one seems to secure the greatest pleasure and benefit from it, though in many cases one must also be governed by the matter of convenience and the demands of his daily occupation. It may be stated in a general way that the time of day at which one will derive the greatest benefit from his exercises is the time at which he most enjoys them. If the necessities of his work conflict with his desire to take his exercises at a certain preferable hour, then he should modify his plans accordingly.

There are those who enjoy their exercises most in the evening, and who also find that they can execute them better, with less of stiffness, than in the morning. In such a case, I would recommend that the exercises be taken at that time. Perhaps the very best time of day in nearly all cases is the afternoon, but the usual working hours of all those employed in business or industrial circles makes this impossible. In the case of certain lines of business in which office hours are short, it frequently happens that it is possible to get one's daily exercise in the late afternoon, which I would especially commend, as a means of relieving the mental fatigue of the day's work,

getting rid of the cobwebs in the mind, figuratively speaking, but literally getting rid of the fatigue-poisons in the brain and body.

But though many will choose the evening, when they cannot devote a part of the afternoon to their exercises, yet probably a greater number will find greater satisfaction in taking their exercises the first hour of the morning, after arising, and one should really be capable of better results at this time because the energy of the body stored up during sleep has not yet been depleted by the day's work. The exercises taken at this time energize one, arouse every organ, tissue and cell in his body to vigorous life and activity, and prepare him to attack the labors of the day with exceptional vigor. At least, this should be the result in the average case, as well as with those who are unusually strong and vital. There are some cases of limited strength and reduced vitality where this plan would not work out so well. One who is not strong, but who is under the necessity of accomplishing a definite and extensive amount of work each day, must conserve his energy in a reasonable way. If he takes as much exercise as his powers will permit without harm, he may find that he has consumed so much of his energy that he will not be able to do justice to his work; he may find himself fatigued long before the day is over, and the ultimate result will be a decline instead of a gain in strength. In a case of limited strength it is often better to choose the evening for one's exercise, taking just enough in the morning to wake the vital and functional system and arouse an active, vigorous circulation.

Briefly, then, I would recommend the morning for one's exercise in most cases, or in other words, the average case, though this is not to be considered as a strict rule and no one should hesitate to select some other time of the day if there seems any reason for doing so.

There is one special and rather important suggestion which I wish to make in this connection, however, and which has to do with the daily long walk in the open air which I would advise in practically all cases. In my discussion of walking

and also of constitutional exercise the reader will see the necessity of spending a certain part of each day in the open air and preferably devoting much or all of this time to walking. The regular muscular exercises for purposes of development and strength building are important enough in themselves, but one will secure infinitely better results in the building of vitality and constitutional vigor if he also takes this walk in the open air, or perhaps goes skating or golf playing, or indulges in some other open-air pastime which will accomplish substantially the same results as the walk. The present suggestion is that the special exercises and the walk should be taken at opposite ends of the day, so far as is convenient or possible. In short, if one goes through his systematic exercises in the morning, then he will best take his long walk in the afternoon or evening, whereas if he follows the practice of taking his special exercise in the afternoon or evening, then he should arrange to take his walk in the morning, preferably the first thing.

Naturally, what may suit one best may not best satisfy another. Each one should make a special and careful study of his own case, and may thereby settle for himself the question of the most satisfactory time of day, with the help of the suggestions which I am offering here.

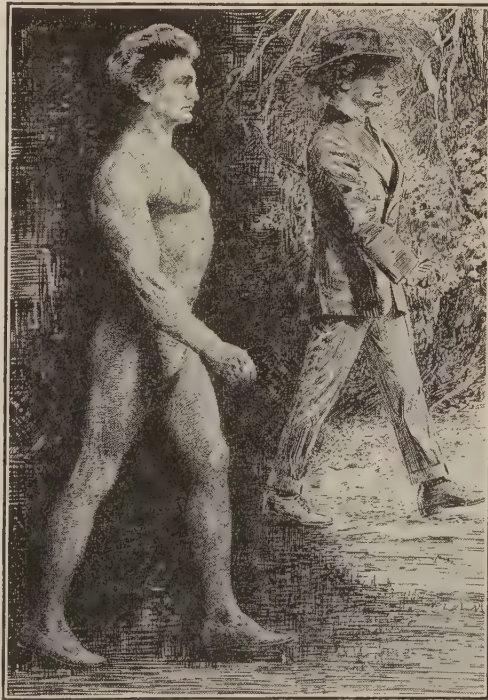
WALKING.—From the standpoint of health-building, walking is unquestionably the one exercise which we could least of all afford to dispense with. No matter what one's occupation, and no matter what other exercises he may indulge in for the purpose of special development, he should always devote a certain part of each day to healthful outdoor walks. It is true that there are many other splendid health-giving activities, but the importance and value of walking in this connection are so great that I have sometimes said that no human being could be in the most perfect physical condition unless he or she did at least two hours of walking in every twenty-four, this, naturally, in addition to other exercises either of a special or recreative nature.

As a rule, if one walks a great deal, a proper position of

the body will naturally be maintained, though it must be admitted that the average man is not enough of a pedestrian to make a correct method of walking a habit. There is a right way to walk just as there is a right way to do anything. Yet no matter how you walk, a certain amount of vigor will be secured from the exercise. But if you move in a slipshod manner, if your movements are not harmonious, you will tire quickly, and will fail to secure the benefits that are easily within your reach by acquiring a proper gait and position of body. Even those who possess more than the average strength will become exhausted after walking a few miles, if they do not understand the secret of the proper method. In fact, an improper manner of walking will exhaust rather than increase the fund of vitality owned by the body.

It is only within the last decade that I have really learned how to walk. In order to do so one must acquire an easy gait, every movement must be rhythmic, and the position of the body must be such that you go forward with strides that are made almost without effort.

At one time I made a practice of taking walks of from fifteen to twenty miles in the morning before going to business, and the more I experimented, the more I became convinced that the exercise is one of an especially valuable nature. I have never been in more



Correct attitude while walking, showing forward incline of the body that should be assumed in walking gait. The illustration is the impression of Clyde J. Newman, the artist, of Bernarr Macfadden in walking stride.

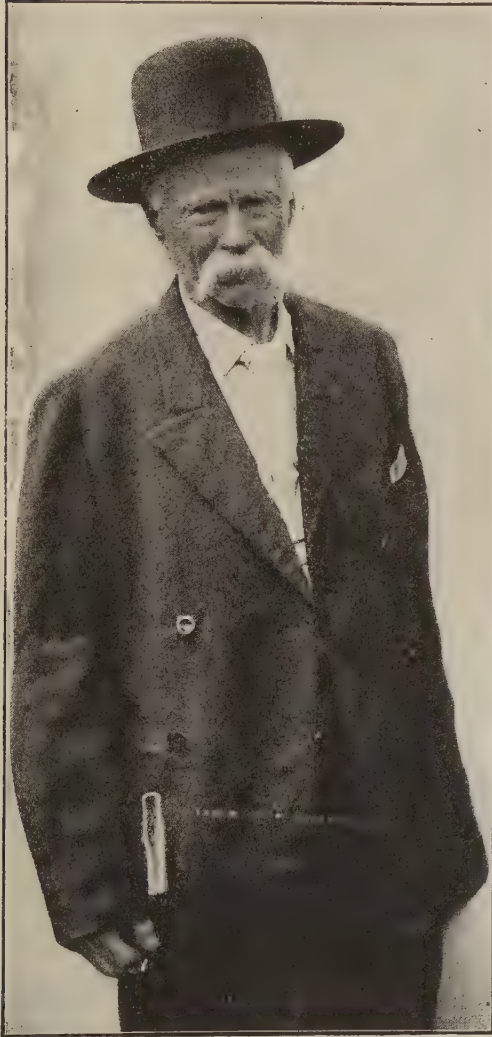
perfect physical condition than when taking such daily long tramps.

Even under the most disadvantageous circumstances, a short brisk walk is always beneficial; but a long walk that will take from three to five hours of steady rhythmic movements, considered as a means of rousing the functional system to increased activity, can hardly be improved upon. The vital organs—stomach, heart and lungs are all beneficially affected. All the depurating organs of the body are prompted to healthful action. The blood is cleansed of impurities, the eyes become clearer, the complexion is improved, the flesh firmer, and all parts of the body are augmented in strength and general hardness.

Cases have often been reported where consumption and other serious maladies have been cured by walking. For those who are striving for health, for those in the grasp of a grave chronic disease, no exercise is quite so valuable as walking combined with deep breathing. It is more especially valuable for cases of this kind named because the exercise is difficult to overdo. If you will simply stop when you are tired, nothing but benefit can be derived from it. I do not mean by this that you should cease at the very first moment that you feel a slight twinge of fatigue, but you can continue with benefit until you feel that you can enjoy a rest with a feeling of pleasurable relief. Naturally, any exercise continued to exhaustion cannot be called beneficial, but it requires a vast deal of will power to continue walking to such an extreme. It is chiefly because of the walking involved that **golf**, hunting and many other outdoor activities are so effective in building health and nervous vigor.

When assuming the proper attitude the pedestrian inclines his body well forward. For walking should be a continual fall forward just as in running. Each step should save you from a fall, and the body should be always inclined far enough forward to insure a continuance of the movement. The entire form should always be erect, shoulders back, chest prominent, head back and eyes looking straight to the front, unless it is

necessary to look to the ground in order to select your path. Many are of the opinion that because an erect attitude is advised in walking, it is necessary to swing the body far backward. This is a serious mistake. There should never be any strain or stiffness in one's attitude. Position of shoulders and chest should not be forced too much. Body should be erect in a natural way. Do not raise the shoulders high. They should be *back, but down*.



Edward Payson Weston, who at seventy-two broke all his life-long walking records from the Atlantic to the Pacific Ocean, walking this distance in less than three months, from Los Angeles to New York City.

Every step must furnish a progressive propelling power, and if the body is not leaning forward this is impossible. If you will be sure all during your walk that the body is held in this fashion, remembering to make every step appear as though it would save you from falling on your face, then you can rest assured that your gait will be commended by the professional pedestrian. And above all your position should be comfortable.

Of course, it is not easy to break old habits, and it will require close attention for a time in order to assume the attitude I have indicated; but careful attention will make a radical change in a very short time and after a

while it will become natural for you to assume a correct gait. The benefits of walking are immensely increased if one will form the habit of drawing deep inhalations of pure air, thus filling the lungs to their greatest possible capacity. In another place I have given illustrated breathing exercises. As a means of increasing one's endurance and the general pleasure of a walk, and assisting in the building of greater vital power, the value of such exercises cannot be overestimated.

Though walking even on brick sidewalks is beneficial, it is far better to do so on the grass or ground if possible. Especially will a walk of considerable distance seem far more difficult on hard pavements of any kind. The proper place to walk is in the country, away from the foul air and the dirt, dust and smoke incidental to urban life. If you live in the city your walk can be made far more pleasurable and beneficial if you will ride out into the country before beginning it. If you are compelled to go to your business at a certain time each day, walk to it instead of riding. A walk of three to six miles in the city though not so pleasurable nor so beneficial as it would be if taken in the country, is still a hundred times preferable to riding. If you live in the country you are fortunate, for you can walk almost any distance you choose before arriving at your place of business, providing, of course, that you do not begin work at a very early hour. If you commence your daily duties at eight or nine o'clock it will not be found difficult to arise at four or five o'clock, and in the interval you can take a long and pleasurable promenade.

It has often been my habit when my duties have permitted to rise between four and six o'clock. Though walking at any time is pleasurable, I must say that in the early morning hours there is a peculiar, almost intoxicating element in the air which greatly adds to its pleasure. The air seems far more exhilarating at this time of the day. Another special advantage of the early hour is that any unusual costume is likely to excite the curiosity of the ordinary late riser. Those who leave their beds at four or five A. M. are, as a rule, too busy to be curious. So I often start out dressed only for comfort, walking bare-

foot, with hat in one hand and coat and shoes in the other. Thus equipped, when I arrive at some point where I again wish to enter the realms of so-called civilization, by stopping at a convenient brook by the road it is an easy matter to remove the dust of travel and assume the articles of clothing that qualify one to become one of the conventional human sheep.

Though my favorite method is to walk barefooted, I have usually used sandals. Foot-wear of this character, however, can hardly be recommended for wear on a dusty road or one on which there is much gravel or stones just as going barefoot is not comfortable or advisable under some circumstances. In using sandals on such roads small particles get into the toes of the sandals and are a considerable annoyance. For ordinary road walking the sandals should have the entire front part of the foot covered.

A method in long distance walking that can undoubtedly be recommended for the reason that it makes it more easy for one to assume the forward incline, the importance of which I have so strongly emphasized, is the long stride in walking.

High speed should be avoided. Three and a half miles an hour is as fast as one should walk to secure the greatest possible degree of benefit and pleasure. If you walk faster you are bound to tire quicker, and there is not nearly so much benefit secured from the exercise. A long, easy stride is advised, making every step a little in excess of that which it is your custom to use in ordinary walking.

It is undoubtedly true that the majority of people walk with nervous tension so that the steps they take are jerky and impulsive, and are devoid of rhythm. The same steps, if taken at greater length, will make it possible for the walker to cover more ground with greater ease and less expenditure of nervous energy and will result in a more natural tired feeling than that that follows the short step action.

It might be well to mention to those who wish to follow my example in walking without shoes, that it will be found difficult to do so until the soles of the feet are hardened. The first few attempts must be confined to a very short walk, but

before long a callous surface will form on the bottom of the feet and you will then be able to walk almost any distance barefooted. I must say that I favor walking without shoes where the roads are at all smooth. I seem to move with less effort, and do not tire nearly so quickly as when wearing shoes. Of course, if sandals are worn that do not confine the feet, there is not a great deal of difference between them and the bare foot, but no matter how nicely a shoe may fit, it always interferes to a certain extent with the free circulation of the blood and hence its power for evil.

It will probably be sufficient at the outset to walk four or five miles. Try first of all to acquire a proper position before you attempt to cover much distance. In fact, it would be well to avoid trying to see how far you can walk. It is not really distance, but *increased vital power* that you are endeavoring to acquire. This is the only result that is of any special importance.

If one is inclined to be too fleshy or "soft," long walks will naturally reduce the weight. If you are too thin they will increase your appetite, and in time increase your weight, though during the first week or two, if they are regularly taken, your avoirdupois may be reduced slightly, yet very quickly thereafter a decided gain may be looked for.

It is proof of the great value of walking that athletes everywhere, no matter for what event they may be preparing, always make it a part of their training. They do this because it builds vital power. Such added vitality enables them to increase the vigor of the muscles that they expect to use most in their contests.

Then, too, it is well to note that walking keeps one young. It delays senility. It drives out old age cells, and makes every part of you throb with life and health and strength. One of the youngest old men that I ever saw in my life was a professional walker who claimed that he made a habit of walking from fifteen to twenty miles a day, and although a man of nearly sixty years he had the complexion of a sixteen-year-old girl, and did not look more than thirty-five.

It is always an advantage to have some destination in view. When you start out, select some place that you would like to reach. Wandering aimlessly here and there is never of so much benefit as an exercise, though undoubtedly it is pleasurable. If you are walking in the country, select a town a few miles away and although there may be nothing of interest there that you desire to see, yet you will have the satisfaction of knowing that you have a definite destination.

Above all things, one should remember that regularity of breathing is of special importance. If you are unable to regulate your breathing satisfactorily you might adopt the plan of inhaling during a certain number of steps, say six or eight, and then exhaling while you count a similar number.

As for competitive speed walking it is perhaps just as well that we do not take up this particular feature of athletics, for nearly all other sports are more interesting and much better exercise. There is no doubt that heel-and-toe walking affords vigorous exercise for special muscles, but it is somewhat awkward and a rather unnatural method of locomotion. It is infinitely harder than running, even though one does not move so fast. In the beginning, it seems to involve so much of a strain upon certain muscles unaccustomed to it that it is very uncomfortable. Ordinary walking is the ideal exercise for constitutional benefit, but when one wishes to increase his speed above a certain moderate pace, the natural and instinctive action is that of running. Running just a little faster than a brisk walk is so easy that one in fair condition can keep it up for many miles. Natural activities are always the best, and our sports should follow natural lines, for pleasure and for benefit.

The natural walk is the ideal long distance proposition, and competitive walking, if any, should consist of long distance jaunts at a normal pace, rather than doing a mile or a half-mile by the somewhat awkward method of the so-called heel-and-toe. For functional vigor, for nervous energy, for mental activity and the general harmony of body which go with these, there is nothing like long walks through the country.

CHAPTER II.

BUILDING A POWERFUL PHYSIQUE.

BEFORE putting into practice the measures necessary for developing a powerful physique, the student should be familiar with the structure of the muscular system and its requirements. He should, therefore, make a study of muscular anatomy as given fully in Chapter VI of Volume I, and should also familiarize himself with the contents of those Chapters of this and further volumes of this work dealing with various phases of the subject of exercise.

He will see from all this that a powerful physique is to be desired not merely for the sake of external muscular strength, but for the sake of health, vitality and resisting power. Even though he does not truly require muscular strength in his daily occupation, yet it means the possession of great energy which can be turned in any direction. It means a reserve of power which will be invaluable in time of emergency. Great physical strength means internal as well as external energy; it is invariably associated with splendid digestive and assimilative vigor, general functional strength and a robust condition of all internal organs, for reasons which have been given in the other chapters above named.

There are those who so misconceive the meaning of health that they declare themselves to be in good health if only they are not bedridden with disease or some form of chronic invalidism. In their stagnant, phlegmatic existence, they do not understand what it is to be more than half-alive, which really means to be half-dead. They think and they say that they are in good health if only they are able to be out of bed, able to walk around a bit, to dress themselves, and to sit up at the table for three gorging meals each day. But surely, this is not health.

There are degrees of health, varying from that condition of which it may be said that one is not longer in positive ill-

health up to that which represents the very maximum of physical energy, beyond which it is impossible to cultivate one's powers. The true physical culturist should be satisfied with nothing less than this, but it is a condition which is impossible except with the possession of a robust physical development, the most perfect degree of vigorous animal life. One must be strong, feel strong, with the sense of strength and undiminished energy in every part of the body, and this is impossible to the undeveloped man or woman. The man who realizes that he is in need of nervous strength should know that any material degree of nervous energy is impossible if he is muscularly inactive and atrophied, if he is one of the "bone-yard" type, or if he is handicapped with a heavy burden of surplus, unhealthy fat. The admiration which women have ever felt and expressed for manly strength, and the like admiration of men for well-built, shapely women, indicating robust, vigorous womanhood, is only an expression of the instinctive recognition of the biological value of strength. It is a recognition of its survival value in the struggle for existence, not merely because of the muscular power itself, but because of the vital qualities which go with it, the vital qualities of which it is the manifestation.

It is true that the essential energy or central power of the body is of a nervous character, and that this is the power back of muscular manifestation, the motive force which moves them. But it is chiefly through the instrumentality of the muscles that this vital or nerve-energy is generated, developed and stored up in the body. Without a vigorous and normal muscular system, one is greatly limited in the acquisition and enjoyment of this vital power.

The old-fashioned notion that great muscular strength was incompatible with health was so absurd that it could only have had its origin in the prejudices of those who knew nothing whatever about the subject, however they may have been informed on other matters. For a time it seemed to be a favorite diversion among those who were lacking in physical development and vigor, and who were satisfied to remain so, to de-

clare that the man who developed his muscles only did so at the expense of his vital organs, when they did not vary the criticism by saying that he did so at the expense of his brain. But from the standpoint of physiology, nothing could be more irrational than to assume that muscular strength means weak lungs and deranged functional organs. The use of the muscles involves the use of the lungs and the greater activity of all vital and functional organs, tending to strengthen and develop these. Far from the inactive man having any advantage in these respects, he could not hope to maintain even a moderately efficient condition of these vital organs. One whose internal vital organs were in poor condition could not possibly accomplish very much in the way of muscular exertion, for the muscles serve only as an instrument or engine for the expression of the power that is within. But at the same time it is through their use that one is able to develop this internal strength. On the average, the internal organs of those who are muscularly strong are infinitely more vital, robust and efficient than those of physically indolent college professors, book-keepers and others who may be in the class of "weaklings."

One need not fear in this respect. It is true that I advise against the utmost extremes of physical development, but this is because, like excess in anything, they are unnecessary rather than because they are injurious. It is true that there have been some cases in which apparently excessive development has been followed by disease, but it is necessary to understand these cases before passing judgment or rushing into print. It may be said briefly that in the occasional instance where the phenomenal athlete or "strong-man" has come to grief, physically speaking, it has been because of over-work, his using up his vitality faster than he could build it, as in any other form of over-work, and not because of any supposed antagonism between muscular strength and health. And in the majority of cases, if the truth were known, these athletes and strong-man prodigies have undermined their constitutions through dissipation. In the past very few of them have ever paid the slightest heed to the laws of

health or the requirements of hygiene, as do many athletes of the present day.

To build a perfect and powerful physique, symmetrical and of uniform strength in all its parts, it is essential to correct any defects or special weaknesses which may be present in any individual parts of the body. The vigorous exercises for various parts of the body suggested in this chapter are intended to accomplish such corrections, wherever necessary, but since the exercises which will overcome special defects are identical with many of those for developing a high degree of strength in the same part of the body, the corrective exercises, as such, have not been separated from the group of general exercises for development applying in each case to a specific part of the body.

(See also *Corrective Exercise*.)

The *value of wrestling* as a means of developing a powerful physique should be emphasized, taken either by itself or as supplementary to other exercises for the purpose. Of all sports and games, wrestling is by far the best to develop a high degree of strength in all parts of the body, except perhaps the legs, and it has the advantage of combining strength with endurance and a certain amount of quickness. It may be commended for developing a robust state of heart and lungs as well as for perfecting the external body. Good wrestlers always have strong backs and necks, since success in the game depends so much upon these parts. For this reason also, wrestling is especially useful as a supplement to the special exercises for the back and neck presented in this chapter.

The exercises on pages 800 to 831 of the present chapter are to be given special attention because of their fundamental importance in the building of a powerful physique. In this connection the student is referred to those parts of Volume I in which the central features of Physcultopathy are discussed, and particularly to Chapter V of Volume I, in which special attention is given to the relation of health and strength to the energy of the spine and nervous system. The student should make a careful study of the aforesaid chapter because

everything else hinges to a certain extent upon the matters therein referred to.

It is needless to repeat here what has been said about the office of the spinal cord as the great storehouse and center of energy, or to reaffirm that the spine and entire nervous system may be energized by special measures and exercises for strengthening the back, and accelerating the circulation throughout the entire region of the spine. The practical application of some forms of treatment for this purpose will be taken up in the sections of this work dealing with curative matters (see *Mechanical Physcultopathy*, Vol. III). Some valuable exercises for energizing the spinal cord are presented in Chapter III, Volume III.

These pages contain a number of general exercises for the arms and the development of other parts of the body, but the important movements are for the neck and back, since they apply directly to this subject. Remember that these exercises are fundamental, not merely for the sake of strengthening the muscles of the back and neck, which they will accomplish vigorously, but because the increase of vital or nerve-power which they will bring about will mean increased energy for every other part of the body as well. They will enable one to get quicker and far greater results by the special exercises for each part given in this chapter. Taken altogether, and practiced faithfully, one could not avoid a remarkable change both in his physique and working energy.

Perhaps I should add a word of caution to those who are not yet very strong. Some of the exercises for the neck, in Volume II, may take on the appearance of rather advanced exercises for those who are just beginning the practice of physical culture. In such a case they would better be left alone, for nothing is to be gained by straining any part. It would be better to continue with light exercises until strong enough to take all of these movements without discomfort or over-exertion. Most of them, however, could be executed in a modified form, without placing too great stress upon the muscles, right from the start.

CORRECTIVE EXERCISE.—Corrective exercise may be distinguished from remedial exercise, in that the latter has to do specially with the influence of certain exercises or forms of exercise in overcoming disease, whereas the former is concerned with movements that tend to correct special weakness, defective development of parts of the body or various deformities. The subject of remedial exercise, therefore, is left for consideration in the later parts of this work having to do with curative physical culture. We should not lose sight of the fact, however, that all appropriate exercise for one who is in ill-health takes on a remedial aspect, inasmuch as it is largely through such exercise that he gains strength and acquires that improvement in his circulation and functional tone which is bound to bring about a condition of normal, vigorous health.

Similarly, almost all general exercise has more or less of a corrective aspect. Let one set about building up a vigorous and perfect physique by all-around exercise, aiming at a symmetrical and uniform development of the whole, and any special defect in his development or any minor deformity will tend to disappear just as certainly as he gradually accomplishes the condition of symmetry at which he is aiming. All ordinary exercises tend to restore a normal state of the body in case there is anything out of gear. And yet by special attention to any peculiar defects or weaknesses, one can correct the difficulty much more quickly and definitely by special exercises directly intended for the purpose.

Suppose for instance, that through negligence and faulty carriage, or possibly through one-sided manual labor, one has developed a slight *curvature of the spine* and carries one *shoulder lower than the other*. In such a case vigorous all-around exercise would go far to remedy the trouble, but special exercises for building up the depressed side, and particularly for strengthening the muscles of the back and straightening the spine will accomplish the desired improvement more effectively and in much less time. While speaking of spinal curvature and disparity of the shoulders, I would say that the exercises for



ILLUSTRATION OF PROPER CARRIAGE OF BODY.

Proper carriage of the body for avoiding and correcting round shoulders. The importance of assuming a proper position at all times, whether sitting or standing, should be thoroughly understood. The position here shown is one that can be especially recommended. The shoulders should be back, the abdomen should not be drawn in as is commonly recommended. It should be relaxed and perfectly free to move outward and inward as the breath is inhaled and exhaled. There should be no strain in any part. Correct position in both sitting and standing is not only necessary to avoid round shoulders, but for the best general health. Study the position here shown and try to acquire a proper position at all times. Also read the discussion of poise and good carriage in the chapter on Physical Training for Women.

the shoulders given on pages 826 and 827 are ideal and invaluable for this particular purpose.

"*Round-shoulders*," so-called, are exceedingly common and also quite easy to correct, providing one is persistent in the exercises necessary. Here, again, all ordinary exercises for the back and shoulders tend to improve the condition, but special exercises for bringing the shoulders far back at the same time that the muscles are powerfully strengthened will establish them in their proper position much more quickly. This drooping tendency of the shoulders arises first from weakness of the muscles back of them, though to a certain extent it is due to the weakness of the entire back which leads one to assume a slouchy, careless attitude instead of an erect and vital carriage of the body. In many cases it is a matter of constitutional debility. Certainly the man who is blessed with physical power and vitality plus carries himself erect; he does not droop or sag at the shoulders. It will be apparent, therefore, how exercises for the back and shoulders will correct this difficulty, especially when they are designed to pull the latter back and up into normal position.

It is natural that a *flat* or *sunken condition of the chest* should go with round-shoulders, as expressing the same lack of vital energy. Even when the chest is originally of good shape, it cannot avoid being compressed and narrowed in the round-shouldered attitude, thus cramping the heart and lungs, and giving occasion for still greater debility. And not only this, but as the chest is contracted in this manner, the entire front of the body is depressed, causing a crowding of the digestive and other functional organs and a greater or less prolapsus of the same. To fill out and build up the chest properly it is absolutely necessary to overcome any tendency toward round-shoulders, to assume a proper and erect carriage of the upper body, both in standing and sitting, and also to adopt such special exercises as will raise the chest, expand it and strengthen its muscles.

It should be noted that in the influence of corrective exercise we are not limited to the mere possibilities of enlarging the

muscles and thus improving the outlines, but the bones themselves yield to a marked degree in the course of time. With all their strength and stability, the bones are yet susceptible to any continued influence, not only in the direction of gradual deformity, but also in the correction of such deformities. With the formation of new cells they will slowly modify their shape if sufficient stress is brought to bear upon them. This is naturally most true in childhood, when the bones are more cartilaginous, and as one leaves his youth behind him, with the increase of mineral matter in the bones, the possibility of their modification in this way becomes ever less and less. Some time after maturity, therefore, one reaches a limit beyond which he cannot expect to materially alter his bone framework, but just when he reaches this point would be difficult to say, since it varies in different individuals and depends partly upon the circulation and health. It is to be expected, however, that the matter of overcoming deformities will usually be taken up in childhood or youth, so that in nearly all cases we can depend upon any necessary moderate modifications of the bones. Such defects as round-shoulders, slight spinal curvature and others in which there is no real bone deformity, may be corrected at any time of life, even after the bones have become brittle.

The earlier in life that any deformity is taken up for correction, therefore, the better. In the beginning the bones are little more than cartilage, but they continue to retain enough of gelatine throughout childhood to make them elastic and pliable to a certain degree. We have often seen the legs of a child badly bowed at one year of age, the lower legs bent shockingly, and then we have seen the little limbs straighten out perfectly by themselves in a year or two, with the growth of the youngster. So does Nature tend to correct herself. But in most cases *bow-legs* and *knock-knees* can be overcome in childhood by a little care to exercise and influence them properly. Rubbing each day with only moderate pressure in the one right direction, will have its effect upon the changing, growing cells of the live little bones. In bow-legs, they should be rubbed on the outside with gentle inward pressure, and with knock

knees, the reverse should be the case. The wearing of braces for the purpose is sometimes effective, but the remedy is an unsatisfactory one in many cases because it is weakening, and for that reason often defeats its own purpose. Usually it is better to cultivate strength of the legs by exercises which have the corrective tendency. With the exercises the circulation in the limbs will be full and vigorous, which in itself is an important factor. After maturity not a great deal can be done radically to alter a bowed or knock-kneed condition of the legs, but in every case they should be muscularly well developed so that by this greater symmetry their appearance will be so much improved that the defect will be less noticeable.

In the so-called "chicken-breast" or "pigeon-breast" the difficulty lies entirely in the malformation of the bones, though chicken-breastedness is doubtless caused or aggravated in some cases by the cramping of the chest which tends to force the bones into this position. At all events, such a defect is an easy one to correct in most cases, owing to the unusually elastic quality of the ribs. Even the sternum, with all its marked strength, has a peculiarly plastic quality. When I say, "easy to correct," I do not mean that results can be accomplished in a week or a month, but that the improvement can be made with certainty and satisfaction if one is persistent in his efforts. It is necessary to strive for a normal and vigorous condition of the chest, the same as when building up a flat chest. With the shoulders back in their proper place, the chest should be raised and expanded, and the muscles of the chest should be vigorously used and strengthened. The result will be to pull and force the ribs into a normal position, and the changes in the symmetry and structure of the chest accomplished in some cases of this kind are almost startling.

Many common defects and special weaknesses are merely the manifestation of muscular deficiencies, and in all such cases they may be corrected speedily by concentrating upon exercises for those parts. The exercises in this chapter are designed both for corrective purposes and for the thorough development of each part of the body.

In the following pages are presented special exercises for the various parts of the body, designed for the individual development of each part, and for the correction of special defects or weaknesses which may be found therein.

ABDOMINAL MUSCLES.—See *Stomach*.

ARMS.—It would seem quite apparent that not a great deal need be said about the importance and method of developing the arms, inasmuch as every novice in physical training, even every school boy, gives his first attention to the development of these members. However, strength and symmetry of these parts is necessary not only for the sake of their ordinary uses, but as a means of accomplishing the best results for other parts. Weak and undeveloped arms as a rule indicate a similar condition of the chest, and a large majority of the exercises and activities in which the arms are employed also call for the use of muscles of the chest, sides, shoulders and back. This will be made more clear by reference to the comments in regard to the muscles of the arm given in Chapter VI of Volume I. For instance, the chest muscles are used along with the extensor muscles of the arm in striking a blow. The muscles under the arm are employed in “chin-ning” while shoulder muscles are used to help in raising the arm above the head.

Developing the Upper Arms. There are many exercises that may be employed in the home and gymnasium for developing the upper arms. For a vigorous exercise for the biceps there is nothing much better than “chin-ning” or pulling up to a bar with the arms. Every school boy knows this exercise, which may be made doubly effective for the very advanced gymnast by doing it with one hand. If this is too difficult one may pull up with both hands, then, hanging on with only one, lower the body very slowly. For the triceps the reverse of this movement may be found in a movement to be performed upon the parallel bars, or upon the parallel backs of two chairs, or the edges of two tables two feet apart. In the latter cases the knees must be doubled. First rest the body on the hands, arms straight at

the sides. Then bend the elbows and lower the body until the shoulders nearly reach the hands, at which point push up and straighten the arms again. This exercise, like chinning, employs the *latissimus dorsi* and other muscles of the torso under and around the armpits, but is nevertheless splendid for the triceps.

Strengthening the Forearms, Wrists, Hands and Fingers.

In a great many cases the general development or lack of development of the body is very largely covered by clothing, so that even one who is miserably lacking in his physical proportions may often hold up his head as though he really has cause for the fullest self-respect. The conventions of clothing, however, do not insist upon the hiding of the forearms and these parts often come conspicuously into view. The rest of the body may be permanently protected from the eyes of others, but the forearm and the neck will give one away. The well-set-up, vigorous man or woman has a full, well rounded neck and a shapely, well-modeled forearm. It is a peculiar fact that one can not only judge of the strength and vital energy of an individual by his "grip," which of course is the expression of strength in the muscles of the forearm, but also, through them, of the vitality and nervous vigor behind. It indicates mental as well as physical vigor, for all observant persons will notice that strong and successful men and women, those of exceptional energy and of strong personality, invariably have a powerful grip. The weakling or the nonentity, lacking in personality, magnetism or distinct vital qualities of any kind, is found to have little or no "grip," does not take hold of things as if he meant it, and really has no capacity so to take hold. In many cases strength of character depends very largely upon the condition and strength of the body. By building normal physical vigor, in many cases the weakling can do much to acquire magnetism, personality and character, to the extent that his hereditary endowment has made these qualities possible.

It is said that it is largely through the use of the hands, the organs of manipulation, that the human race learned to



EXERCISES FOR STRENGTHENING THE ARMS.

No. 1. A vigorous tensing exercise for the arms. With arms first down at the sides, and fists tightly clenched, vigorously tense and harden all of the muscles of the arms and slowly flex them at the elbows, until the fists are up in front of shoulders. The wrists should also be flexed as shown in the photo. Slowly extend the arms, relax, and repeat.



No. 2. A resisting exercise for the muscles of the forearm. Placing the fist of the left hand under the palm of the right hand, flexed upward, and resisting with the left hand, flex the right hand downward at the wrist as far as possible. Repeat until tired, then reverse the position for the left arm.



No. 3. With the right palm upward, fist doubled up, and hand flexed upward at the wrist, place the palm of the left hand against the back of the right, as shown. Then, resisting with the left hand, extend the right and flex downward as far as possible. Repeat until tired and then reverse the exercise for the other arm.

think and developed the intelligence which later manifested itself in speech. And in the case of the infant, in whom is epitomized the experiences of the race, it is through the use of the muscles and especially of the hands that the little mind at first develops. There seems to be a peculiar relation between the grip and the mind or nerve force, for while this same relation exists between the nervous system and all other muscles, yet it appears to be particularly intimate in the case of the hands.

As will be obvious to the student of anatomy, strength of the grip and of the wrist really means strength of the forearm. It is in the forearm that the governing muscles are located. They not only determine the clutch and the extension of the fingers, but also the flexing of the hand at the wrist, in all directions. When we develop power in these muscles which bend the hand at the wrist independent of finger action, we increase the apparent strength of the wrist. I am illustrating here some resisting exercises for this purpose, though the student will note that he can extend the list to include similar movements against resistance in every direction in which the hand may be moved. The wrist itself, as was seen in the study of anatomy, is not a muscular structure, but at the same time its firmness and strength, that is to say, the toughness of the tendons by which the forearm muscles have their *insertions* in the hand, and the resisting power of the many bones of the wrist, depend upon the muscles named and the resistance which they have to overcome. Subjected to much stress and activity, all of these tissues will be strong, firm and vigorous. If neglected and unused, they will become tender and weak, incapable of much resistance. All tissues, including cartilage and bone, depend for their condition to a great extent upon muscular action and the more perfect circulation and nutrition which accompany such muscular action.

This is true of the fingers as of the wrists. Strength of the fingers involves the condition of the little bones and the strength of the little joints as well as the mere contracting power of the muscles which operate them, but this strength

EXERCISES FOR THE WRISTS AND FINGERS.



No. 4. First flex the right fist sidewise, as far as possible (to the side of the little finger, but neither forward nor backward), placing or hooking the left hand over the thumb side of the fist. Then, resisting with the left, bend the right fist over to the other, or thumb side. Repeat and reverse as in the preceding exercises. Other variations of the

same form of exercise should be practiced, bending each wrist in every possible direction against the resistance of the other hand.



No. 5. *For strengthening the fingers.* First place the finger tips together in the manner shown in the upper photograph. Then, pressing vigorously together, let them slowly spread out to the position shown in the lower picture, resisting each other moderately and not enough to place too much strain upon the joints. The practice of this exercise, gradually increasing its vigor, will greatly strengthen not only the muscles concerned, but the joints and ligaments of the fingers as well.

of joints, bones and tendons is developed by resistance and the use of the muscles.

Those who suffer from weak wrists and hands, therefore, should systematically practice the exercises given here, together with other exercises which offer a progressive resistance, the amount of resistance being increased gradually as the parts grow stronger. Such manual labor as bricklaying, for instance, is guaranteed to strengthen the wrists, though one who had very weak wrists could do only a little of it in the beginning. It is important not to strain the wrists or the fingers too much at any time. Handling all kinds of objects with the hands, as for instance, heavy furniture, would be effective, but perhaps one of the best forms of exercise for the wrists is exercise on apparatus in which the weight of the body is placed on the hands, for instance, the parallel bars, vaulting horse, flying rings or horizontal bars.

Such exercises will be of great value in developing the grip as well. In a general way, it is unnecessary to give any special attention to the grip if one uses apparatus, since practically all exercises will require the more or less vigorous use of these muscles. I am presenting an exercise for the fingers which will be suggestive of other similar movements for strengthening them, though these will not be necessary except where one particularly wishes to strengthen the fingers. The pianist may have occasion to practice special exercises for the fingers, stretching them apart and in other ways adapting them to the requirements of his piano technique, but there is naturally a limit to the strenuous exercise for the fingers which he should take, lest he sacrifice flexibility and speed for rigid strength. Strength he must have for effective rendering of good music, but all-around bodily vigor will suffice for this, and his exercises on the piano will probably offer the best finger gymnastics for his purposes.

The ordinary man or woman who wishes to strengthen the grip can do nothing better than practice taking hold of things with all possible vigor, as in shaking hands. Shake hands as if you meant it, and more too. Shake hands with yourself,



EXERCISES FOR STRENGTHENING THE BACK.

No. 1. Lying face downward, and placing the hands together on the small of the back, raise legs, head and chest simultaneously, and just as high as possible. Upon reaching the position illustrated, make another attempt to raise extremities still a little higher. Lower feet and head, rest a moment and repeat, continuing until tired.

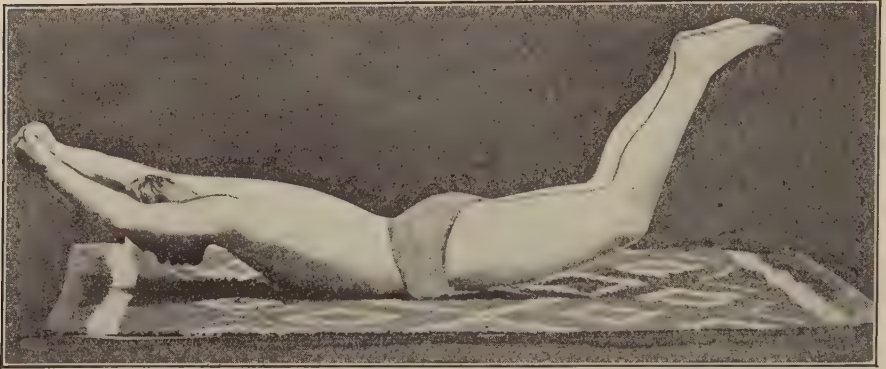


No. 2. Lying first face downward, shift weight slightly to one side, lifting the legs and head as high as possible, and the shoulder of the opposite side. Relax and repeat, then take the same exercise, shifting slightly to the other side.

tightly gripping and squeezing one hand with the other. A splendid means of strengthening the hands is by tearing up old magazines before throwing them away, tearing old paper bound novels, packs of cards, or newspapers folded up a number of times to a thickness that will offer stubborn resistance. Do this every day, and you cannot avoid developing a powerful grip and a pair of forearms of which you may be proud.

THE BACK.—*How to Strengthen It.*—There are many reasons why strength of the muscles of the back is of the utmost importance. Foremost among these are those which I have discussed in connection with methods of invigorating the spine and nervous system through exercises for the back, but aside from the influence of such exercises upon the nerves and the building of increased vital power, a vigorous condition of the muscles of the back is absolutely essential for the sake of the general muscular efficiency of the body and other vital requirements. In addition to its being the home of the great nerve center of the body, the bone-and-cartilage structure of the spine is the central supporting column of the body, upon which everything else depends. The spine is like the trunk of a tree, from which strong central body all the branches and foliage are hung. The spine is like the upright of a powerful derrick, the upright that really supports all of the weight, while the muscles of the back are like the guide ropes. If the guide ropes are weak or loose the derrick is useless, and trouble as well as danger is inevitable. If the muscles of the back are weak, the spine no longer retains its upright form, and there is trouble. The arms are like the arm of the derrick, depending for their power upon the stability and supporting strength of the upright and the muscles or guides which control it. The man with the weak back finds himself sadly incapacitated in almost all forms of physical endeavor, and thousands of women, similarly weakened and suffering, know the hopelessness of trying to accomplish anything in their condition.

Not only are the arms attached to this central supporting



EXERCISES FOR STRENGTHENING THE BACK.

No. 3. Another exercise similar to that shown in No. 1, except that the outstretched positions of the arms beyond the head, affording much greater leverage, makes the exercise much more vigorous and difficult. This takes in the muscles all along the back.



No. 4. Another method of taking the last exercise which may be even more satisfactory in many cases. Lying with the stomach across the seat of a chair, the legs on the one side and the arms on the other may drop to the floor, calling for more action in raising them as high as possible. These exercises for the back will of course be taken in conjunction with others given elsewhere, especially those in the class drills which have to do with bending the body forward.

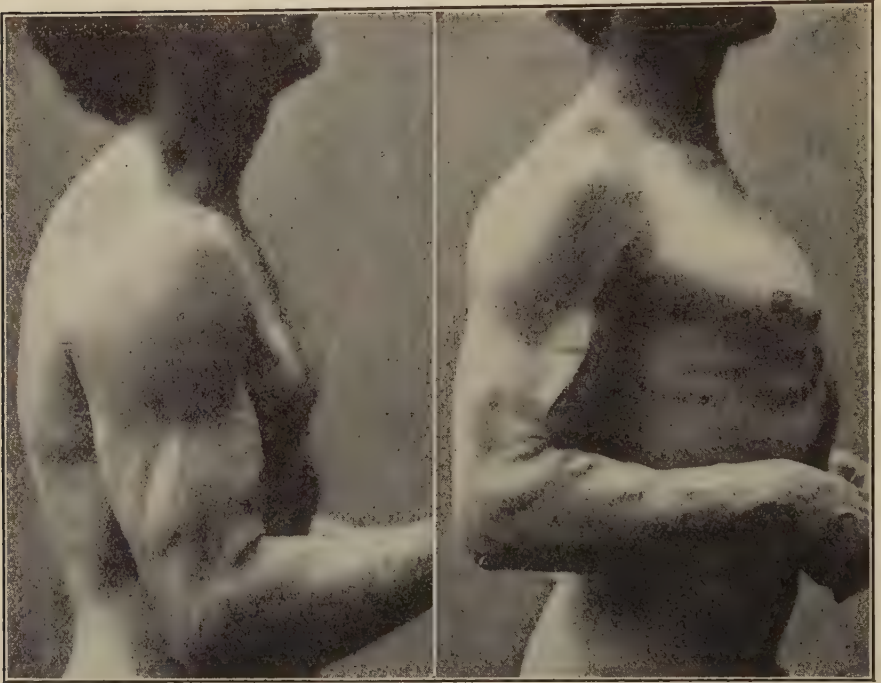
column; nor is the head, whose poise depends upon it, but all of the vital organs of the trunk of the body are related to it, hanging, so to speak, vertically from the spine. Any improper position of the spine, any inclination or bending, due to the weakness of the muscles of the back, has the effect of contracting or cramping the chest, and of bringing about more or less sagging and prolapsus of all of the vital organs, thus interfering with their best functioning and as a consequence depleting the vitality of the body as a whole.

It is truly a simple matter, however, to strengthen these muscles of the back and in that way not only to help restore the tone of the vital and functional organs, but also to give increased muscular efficiency to the arms and other parts of the body as well as to the muscular system as a whole. These muscles of the back are capable of tremendous power, as might be expected from their peculiar importance in the welfare and activities of the body. By those who have undergone special training, great lifts may be performed by the strength of the muscles of the back alone, and indeed, in all weight lifting exercises the back plays a most important part, in some cases performing the active effort of the lift and in others serving a purpose not unlike the support of the upright and guide cables of the derrick. In any case, great strength and power in the back are required for the sake of normal vigor and physical energy.

In another place I have pointed out the fact that successful wrestlers and all notably strong men have very powerful back development and strong necks as well. This strength of the back and spine always insures that erect and vigorous carriage of the body which denotes vitality. It means tremendous energy, whether this is to be devoted to physical or mental activities, to the struggle on the wrestling mat or to the warfare sometimes waged with the pen, the struggle of the mind in law or literature. It is the "backbone" of those qualities which make for success.

The exercises presented here are intended to develop a powerful degree of strength in the muscles of the back, but

EXERCISES FOR DEVELOPING THE CHEST.



No. 1. Bring the shoulders as far forward as you can, in the manner illustrated. Then, after bringing them as far forward as possible, make two or three attempts to force them still farther forward. Relax and repeat, continuing until tired. For pectoralis or breast muscles.

No. 2. The reverse of No. 1. Bring the shoulders as far back as you possibly can, inhaling deeply at the same time, and then make two or three attempts to bring them still farther back. Continue until muscles tire. This exercise affects the muscles back of the shoulders vigorously, but is of great value in the present connection in expanding the chest, an important factor in its development. Many other shoulder exercises are of value in the same respect. These two exercises may be combined into one movement if desired.

as indicated previously, tend to help the entire system and give strength and vigor to the brain, mind and mental outlook. These exercises for the back and neck are intended particularly for the energizing of the nervous system and in that way designed to increase the power of the entire body, yet they are none the less effective for directly strengthening and developing the muscles of the back and neck.

CALVES.—See *Legs*.

CHEST.—[See also *Lungs*.]—What an unmistakable picture of low vitality and lack of resistance is seen in the flat or sunken chest! It is not simply for the sake of physical comeliness and symmetry that one should strive to overcome any deficiencies in this respect, but because of what it means in its relation to the energy and stamina of the entire body, and to the question of sustained health and life. There is good reason why even the untrained eye will pick out the flat-chested as prospective victims of tuberculosis, if indeed they are not already in the throes of that disease.

A round, full chest is indicative of vitality and energy; it carries with it the promise of long life. This is because it represents a vigorous condition of the heart and lungs, these vital organs having plenty of room. The flat or sunken chest, however, represents a cramped condition, and manifestly the function of respiration is carried on in a most shallow and imperfect manner. Not only is the blood inadequately supplied with oxygen, but even its circulation is slow and impeded.

In my general remarks on *Corrective Exercise*, earlier in this chapter, I have made reference to the importance of a full chest which the student should re-read in this connection. I have there specially referred to the influence of round or drooping shoulders and the weakness of the back in contributing to a flat-chested condition. It is essential, therefore, to give any necessary attention to the shoulders as a means of making possible the building up of a deep and

powerful chest. In a way, a flat chest is often a result of a condition of general weakness and low vitality, for in his debilitated state one is disinclined to stand upright; he slumps languidly and carelessly; his shoulders hang limply; and naturally his chest is contracted, to the still further detriment of his health and the body generally. On the other hand, the man who is saturated with vitality, so to speak, with plenty of energy to spare, stands upright with strength and with pride. It is often noticed how one straightens up and throws out his chest in the expression of pride, but this is because of the physical and mental elation which he feels. Any physical dejection, or a mental depression inducing a physical depression, will produce the opposite effect. Therefore increased constitutional strength and improved general health will in themselves have much to do with the carriage and the position of the chest.

However, where there is any lack of development of this part it is absolutely



TENSING EXERCISES FOR DEVELOPING THE CHEST.

No. 3. Standing first with arms hanging at the sides, slowly cross the arms in front of the body in the manner illustrated, bringing them both over as far as possible. Do not do this with a swing, for it should be accomplished with the contraction of the chest muscles only. Some tensing of the muscles will make it more vigorous. Remember that any movement which has to do with pulling the arms forward, or pulling them together in front of the body, brings into play these muscles.

necessary to take special exercises for strengthening the muscles of the chest and for so expanding it each and every day that it will assume a permanently greater girth, even in its relaxed and contracted state. In addition to the exercises offered here, great care should be taken to preserve an erect attitude of the body both when sitting or standing. When sitting down, especially, it is important not to lounge or sprawl, or as one might express it, do not try to sit on the small of the back. High-backed chairs are not to be commended for this reason. If one will put one or both feet under his chair while sitting, and make it a special point to arch his back, he will find that he can sit upright with remarkable comfort, and he will experience a sense of strength or vitality in sitting so, as well as give an appearance of natural dignity, which is impossible to the man sitting on the small of his back with feet sprawling far out on the floor.

The breathing exercises which have been recommended elsewhere will be of great value to be practiced, not once a day, but many times each day, and especially when walking. Diaphragmatic breathing is of course the natural and usual method, but for one deficient in chest development this should be combined with the full, deep breaths which call for the fullest expansion of the chest as well. In other words, let the expansion, when inhaling, commence at the waist line or below, and as that part of the body becomes fully distended let the expansion proceed upward, until the entire chest is enlarged to its limit. This will gradually effect a change in the rib formation of the chest as well as in the muscles, until some day one will suddenly become surprised at the change for the better. One who never knew that he had a chest will become proud of his development in this direction.

Not only can a flat or sunken condition of the chest be overcome by these methods, but other malformations such as those known as "pigeon-chest" or "chicken-breast" can be either modified or overcome. In all cases, exercise of the proper kind will tend to bring about a normal and beautiful contour of this part of the body.



Two poses illustrating correct and incorrect positions of the body, when sitting on a chair. An erect posture favors the development of the chest and shoulders and helps the vital organs in general. A stooped position, on the other hand, affects the regions unfavorably, and causes undue pressure of the nerves. One should cultivate the habit of sitting straight and erect.



In a stooped position, as shown in the picture at the right, the abdomen is forced to bear too much of the weight of the chest and shoulders. Contrast with the position at the left, where the body is awake and coordinate and attentive to the mind, capable of quick response.

Relation of Carriage of Chest and Shoulders to Health.—

On the opposite page are reproduced photographs which illustrate incorrect and correct positions of the body. The posture of the body has a marked effect on the development of the chest and shoulders, and on the vital organs in general. Unhealthful positions are often caused by wrongly constructed chairs, too high or too tight collars, or shoes that throw the weight of the body on the heels. In women we often found partially paralyzed waists or hips, caused by the constant pressure of a rigid corset, tilting the body backward from the waist line up. Fortunately this fashion of dress is passing to the advantage of women both as to appearance and health. While sewing or engaged in housework the chest is crushed and the back humped, while the neck is forced to bear all the strain and weight. Frequently the body is absolutely not only without mental care and control, but shamefully abused, twisted in all sorts of ugly shapes and robbed of its natural automatic freedom.

Most of us are sluggish, inert, half dead on account of nerve pressure. The body is in the grip of some deadly strain or collapsed condition, and we label it according to the location and organs affected by it. Maintain your body in correct position and it is positive and self-protective. Take your lesson from the tree, uplifted to its fullest height, and sustain your trunk, the seat of your vital centers, using every muscle of your body, especially those of the back for lifting the upward portion of the body into correct posture. Equalize the muscular pull by lifting the back muscles. Maintain this hold upon your trunk with free neck and shoulders and joints. Take care to release the diaphragm or else you will interfere with your lung action. Carefully sustain the upper portion of the body unlified, and at all times feel yourself actually suspended by your muscles. Never permit the weight of your shoulders to bear down on your stomach and bowels. Some persons literally sit on their abdomen.

THE HEART.—[See also *The Circulatory System*, Chapter IX, Volume I.]—The heart, like the stomach, is muscular in its nature, this fact often being overlooked, as in the case of the digestive organs, because of the involuntary character of its action. Indeed, the heart may be defined as one great muscle, being a mass of muscular tissue. It is by far the most important muscle in the body, in that it is the central pumping-station of the whole system of blood purification and supply, and, in many respects, it is the most powerful. Contracting and expanding every moment of life it performs a sum of labor far greater than that of all the other organs of the body combined. It is, therefore, highly desirable that it should be strengthened so as to resist not only the general wear and strain upon it, but also any extraordinary stress to which it may be subjected.



Illustrating how one can strike the body with the side of the palm after the muscles have become hardened. Begin at the lower part of the abdomen and strike all parts within reach of the hand. It is best to strike with both hands, alternating from one to the other. Your muscles must be fairly vigorous to withstand this severe treatment, and the open hand should be used until you are hardy enough to stand the strain of this rigorous percussion.



Bend the arm as much as possible, flexing the upper arm tightly to hold it in this position, then bring the arm outward and forward. Now bring the arm inward and strike the body with the arm as far forward as you can. When you have struck the body properly, the position of the arms will be the same as illustrated in the photograph. You may not be able to do this properly at first, but a little practice will enable you to properly perform it.

Exercise of the heart is based on the same principle as that of the digestive organs, the stimulation of its action by the exercise of the voluntary muscles of the region in which it is located. Now, the heart is immediately connected with the lungs both in location and function. Placed in the midst of the lungs, its first duty is to keep them supplied with blood to be purified by them. The amount of this supply is dependent on the call made for it by the lungs, and by their capacity to receive it. Accordingly, by stimulating this call, and increasing this capacity, you develop the heart as well as the lungs by giving it more work to do. Any of the deep-breathing exercises given later in this chapter in the discussion of the increase of lung power will be found no less beneficial to the heart. It may be said here that the essential conditions of all breathing exercises intended to strengthen the heart are, standing in the pure outer air, and breathing deeply.



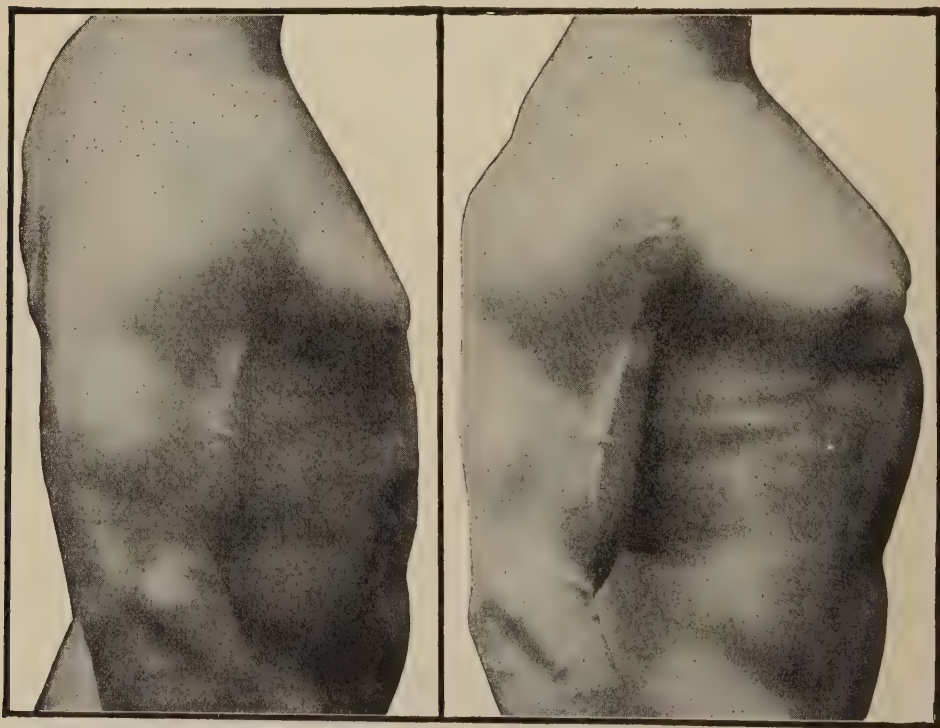
How to reach back immediately under shoulders with the hands, for percussion treatment. It may be a little difficult for you to do this at first, but repeated attempts will soon develop the necessary suppleness.

Says Dr. Albert Adams: "The heart, like any other muscle, owes its vigor to the activity of respiration. The exceptional muscular strength of insects is no doubt due to the fact that they respire from nearly every part of their bodies. Individuals with organic heart disease enjoy the best health when they are able to live an open-air life."

Diet for a Weak Heart.—Warning is given not to make the elimination difficult by overloading the stomach, especially with food difficult to digest. This does not by any means suggest the necessity of starving, or eating so little that you will be poorly nourished, but your diet should be so regulated that

the digestion will go on in a harmonious and satisfactory manner. If your heart is weak you should especially avoid eating too heartily of meats. Stimulating drinks of all kinds should be taboo.

Medical men frequently condemn athletics, maintaining that the exercise often over-strains the heart; but it will be well to note that in nearly every instance where overstrain of this character is observed, the victim has suddenly changed his habits from one extreme to the other, from activity to entire inactivity, though he continues to eat the same quantity of food. The strain, therefore, instead of being caused by the over-use of the external muscular system, is really caused by the overwork of the stomach and other blood-making organs. Investigation will usually prove that it is not the hard train-



Showing the natural position of the body in the region of the chest and abdomen after the breath has been entirely exhaled.

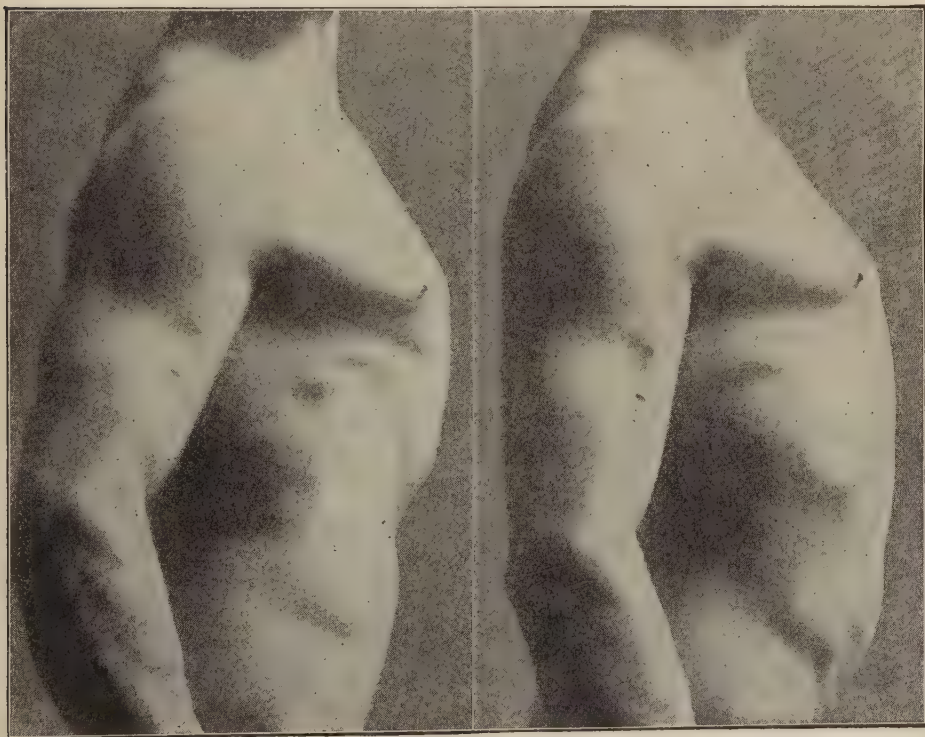
The vital organs of the abdomen may be exercised by exhaling all the breath possible, drawing in the abdomen and forcing out as much air as practicable. Make two or three attempts to force out still more and then begin to inhale.

ing, but the sedentary life and the extremely heavy eating which follow the cessation of training that cause the heart troubles of athletes.

Exercise for a weak heart is as beneficial as it is for a strong one, if it is not carried to excess. It is a fact, well known to both physicians and experienced physical trainers, that any "disease" of the heart that has not progressed to an incurable stage can in time be cured, if the right sorts and amounts of exercise are used. And the heart that is not diseased in the least, but is merely not as strong as it ought to be, can be put in the full prime of condition.

When one is conscious of having a very weak heart, he must exercise with constant watchfulness at first.

Many patients suffering from heart trouble are actually



Another photograph illustrating the appearance of the torso, after all the air possible has been expelled from the lungs.

After exhaling and forcing out the breath as illustrated in the first photograph, inhale as deeply as possible, expanding the chest to its fullest capacity, beginning the expansion in the abdominal region, and expanding every part fully as shown in above photograph.

condemned to die because of the physician's fear of exercise. Now the truth is, that none has ever recovered without a certain amount of exercise. It is absolutely essential to build up the nervous, muscular and functional systems. Supply the body with a better quality of blood, build up superior powers in the stomach and in the nervous system, and the heart is naturally affected thereby. Slowly but surely it will increase in strength and at length become normal.

It is well, however, to remember the necessity of extreme care in taking exercises while suffering from a trouble of this nature. Violent exercises of every kind should be avoided entirely until all symptoms of the disease have disappeared. Light, easy movements, such as moderate walking, and swinging of the arms in various ways will be found of special advantage. You may also exercise with a chest weight for developing the muscles of the walls of the upper portion of the trunk; this, if accompanied by deep breathing, is especially recommended.

On pages 794, 796, 1079, 1081, and elsewhere I have illustrated special exercises to help the large muscles located near the heart. In every instance they will prove of great benefit, often producing immediate relief if an uncomfortable feeling has been noted in the region of the heart.

In these and other exercises to strengthen the heart it should be remembered that those are most beneficial which compel you to take the greatest gulps of air without causing distress to the organ.

THE HIPS.—The muscles of the hips have great power when properly developed, and they should be thoroughly and perfectly developed if one wishes a vigorous degree of strength of the entire muscular system. They have to do with both the back and the legs, and when the legs are flexed against the abdomen, it is the muscles of this region that enable one to straighten out. One could not rise when sitting down, without them, and could not then stand erect except with their moderate contraction. The backward swing of the leg in walking and in running as well as the forward swing, is

accomplished by these muscles, and together with the extensor muscles of the legs they give the propulsive power. Arthur Duffey, the famous sprinter, claimed that he owed much of his speed in running to a peculiar pacing style of stride, the secret being that he had acquired the knack of making the best use of the tremendous power of these hip muscles. In jumping, similarly, these muscles are most important.

It should be recalled that the muscles of the upper leg, being inserted below the knee, have to do chiefly with the movements of the lower leg, just as the biceps and triceps of the arm govern the forearm. The movements of the upper leg in relation to the body are governed largely by the hip muscles, these bearing the same relation to the upper leg that the deltoid, shoulder and upper chest muscles bear to the movements of the whole arm. Viewed in this light, therefore, the student will more than ever appreciate the importance of the development of this part of the body. When there is any weakness or lack of development here, the exercises which I am illustrating will speedily overcome it. Besides walking, hill climbing, running and jumping, kicking, rowing and bicycling, as well as many other outdoor games, will also be effective in helping to develop these gluteal muscles.

THE LEGS.—In a general way it may be very safely said that as a rule the legs are less frequently undeveloped, or at least, less conspicuously under-developed, than the other parts of the body. This is as might be expected, inasmuch as the muscles of the legs get at least a little use in carrying about the weight of the body, even when one does only a little walking or standing, whereas in many cases the muscles of the upper body are almost entirely unused.

However, a little desultory walking or the mere act of standing will not suffice for any real development of the muscles of the leg, as is evidenced by the shapelessness of the great majority of limbs which one may see at any bathing resort. And if there are so few good limbs to be seen among those sufficiently active and fond of outdoor life to go bathing, what may be judged of the condition of those without sufficient energy or

EXERCISES FOR DEVELOPING THE HIPS.



No. 1. Lying face downward, raise the legs, one at a time, just as high as possible, as in the illustration. Having reached this point, try to raise the leg just a little higher still and return to the floor. Repeat a number of times, first with one leg, then with the other.

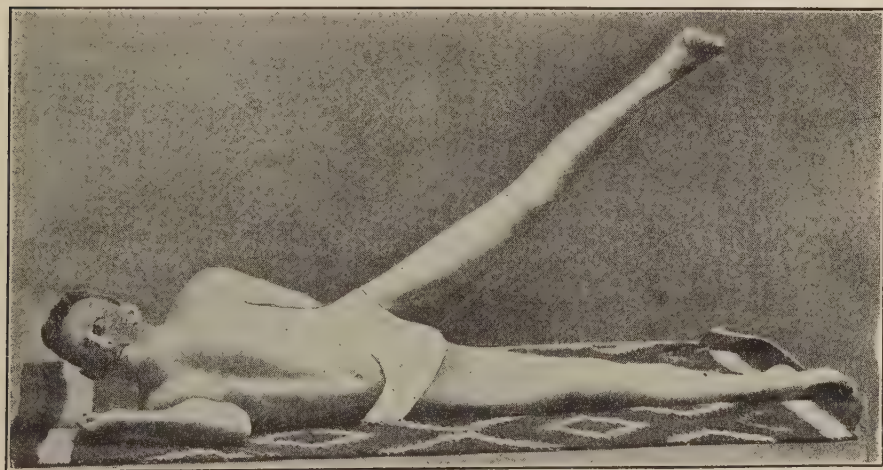


No. 2. With chest and stomach across the seat of a chair, grasping the legs for steadiness, and with the feet first on the floor, raise both legs at a time just as high as possible, as in the illustration. Repeat until slightly tired.

ambition even to go bathing? Any real development or symmetry of the legs requires that truly vigorous use be given these muscles.

In a great many cases, as for instance the all-round athlete, it may be unnecessary to devote any special attention to the legs, inasmuch as one's practice of running and jumping in connection with the games in which he indulges will provide him with the necessary exercise and development. Even in such cases there are sometimes defects of development, such perhaps as the inside of the leg, for which special exercise is recommended. And for the beginner who is generally undeveloped, some special exercise for the legs should be adopted in order that they may be developed symmetrically and harmoniously with the rest of the body. After he reaches a condition of approximate athletic perfection, then he may be able to discontinue the special leg exercises if he finds that his general exercises and games make sufficient provision in this respect.

The work of the legs is so important that it is especially desirable that they should be strong, and that they should not



EXERCISE FOR DEVELOPING THE HIPS.

No. 3. Lying on the side, raise upper leg, with knee straight, just as high as possible, lower and repeat until tired. Same exercise with the other leg, lying on the other side.

become fatigued too readily. Local fatigue of the legs usually gives one a sense of general constitutional weariness or exhaustion which is most depressing mentally, and which interferes radically with the accomplishment of any purpose which one may have in view. It is not enough that the legs should be just strong enough to permit the owner to walk about; they should be so much stronger than this that he will never know a sense of fatigue, no matter how much walking he may do.

And the only way to acquire such strength is by exercise which requires vigorous exertion upon the part of these muscles. Walking as an exercise is the most perfect for constitutional benefits, but it is not sufficient to enable one to reach anything like the full development of the legs. Furthermore, a great deal of walking will never increase the contracting power of the mus-



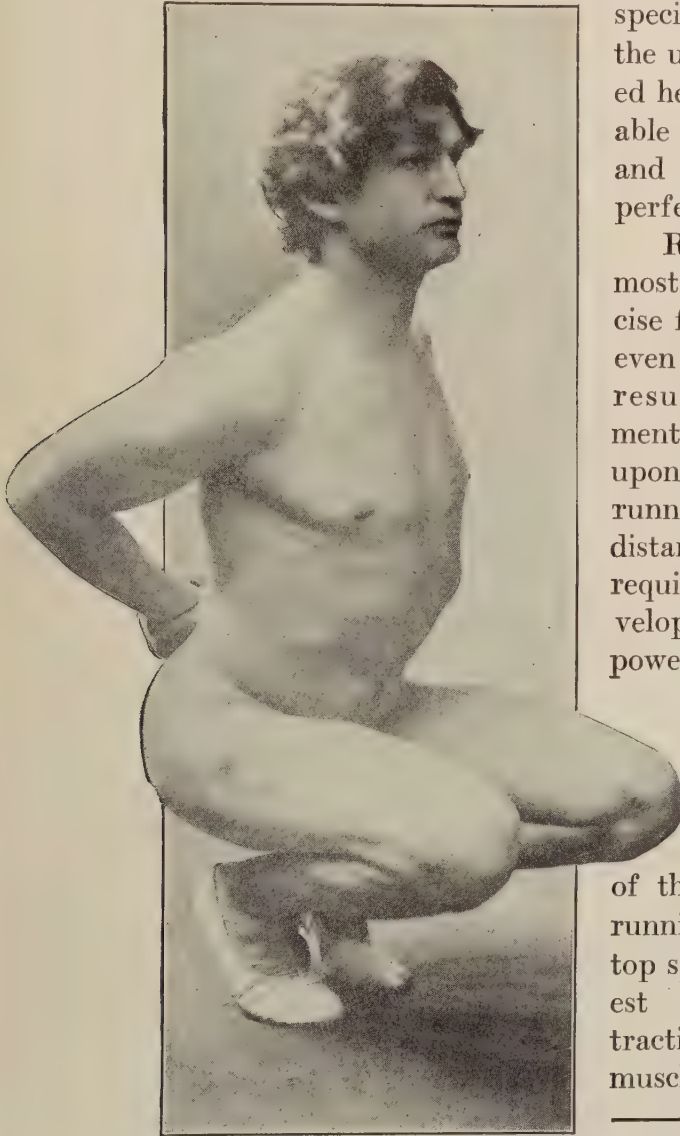
EXERCISE FOR DEVELOPING LEG AND HIP.

No. 4. A very vigorous exercise for the muscles of both leg and hip. Place one foot on a table, stand, or other similar support, lean well forward with outstretched arms, and raise to standing position upon that leg. Should be practiced equally with both legs.

cles above a certain point. But this increased power, acquired by other exercise, will make long walking easier. The

special exercises for the upper legs offered here will be valuable in this respect, and will insure a perfect symmetry.

Running is a most perfect exercise for the legs, but even in running the resultant development will depend upon the kind of running. In long distance running one requires and also develops more muscular power than in walking, but still does not make the fullest and most powerful use of the muscles. In running a sprint at top speed, the greatest possible contracting power of the muscles is required.



EXERCISE FOR DEVELOPING THE UPPER LEGS.

No. 1. Assume position as shown in illustration, with the hands clasped behind the back. Keep the body in a perpendicular position from the hips upward. Now rise to standing position. Repeat until tired. This is an old and simple exercise and is of great benefit for developing and strengthening the upper legs. The exercise can be taken quickly or slowly, as desired.

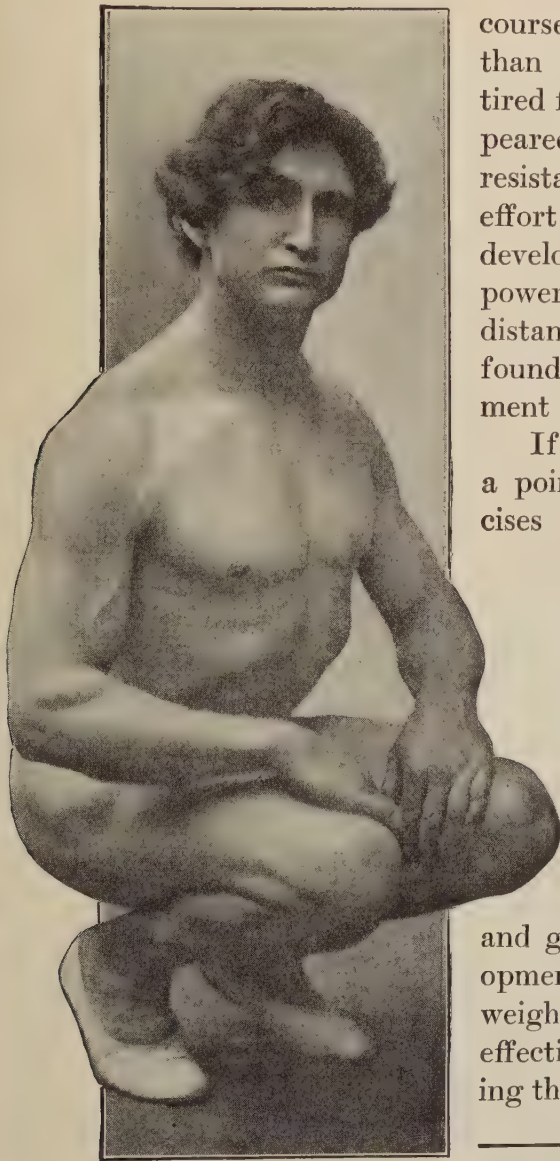
Consequently, sprinting will develop greater immediate contracting power, or in other words, greater bulk and strength, than distance running. Endurance and repetition or continuance more largely depend upon the strength of the heart and lungs than upon the very greatly increased power of the muscles. Supplementary to these exercises, therefore, I would especially recommend sprinting (fast running), jumping, running upstairs two or three steps at a time, hill or mountain climbing, and similar activities, for development of the thigh.

As an instance of the value of such special exercise for the legs, it will be interesting to mention a case that illustrates the point. A young man who was not sufficiently developed for athletic games was greatly interested in distance running, and had developed the lung power, or endurance, to run two or three miles at a stretch, though in far from satisfactory time. But though he could run this distance, he complained of a tired feeling in the legs throughout the day when standing or walking about very much, as well as a "weak-kneed" sensation when running. He was advised to go through a short



EXERCISE FOR DEVELOPING THE UPPER LEGS.

No. 2. Crossing the legs in the manner shown, slowly bend the knees until sitting down "tailor fashion," after which rise to standing position and repeat until tired. Good for knock-knees, and also the general development of the legs.



course of sprinting, and in less than two weeks of this the tired feeling of the legs disappeared entirely. The greater resistance and more energetic effort of sprinting quickly developed more strength and power, so that he took up his distance running again and found a remarkable improvement in his time.

If one ultimately reaches a point at which these exercises for the legs seem too easy, then he may increase their resistance and vigor by supporting some additional weight while executing the movements. To walk a distance while carrying another person on your back will double the resistance and greatly hasten the development. Carrying a heavy weight upstairs is also a most effective exercise for developing the thighs.

EXERCISE FOR DEVELOPING THE UPPER LEGS.

No. 3. First place your hands on the insides of the knees, in the position shown, but with knees far apart. If you cannot keep your balance in this position, lean against a table or chair. Now, resisting with the hands, bring the knees inward until the hands touch as shown in above illustration. Repeat until tired. This exercise is especially valuable for developing the muscles on the inside of the upper thighs. These muscles give the upper leg a symmetrical contour and improve its appearance quite materially if properly developed.

Developing the Calves. Since the calf consists of the powerful muscles which raise the heel and extend the foot, any exercise or sport that involves rising on the toes or keeping on the toes



will fully utilize and adequately develop the lower leg. Such are rapid walking, running, hill, stair and ladder climbing, and jumping for height and distance. Rope-skipping is an excellent exercise for improving the calf. Dancing of all kinds, especially stage dancing and toe dancing, will bring about an unusual enlargement of the lower leg. One who expects results should not repeat any movement until tired out, and should not practice all of these exercises every

day. Such procedure will be more likely to diminish than increase the girth of the calf. All exercise should be carefully adapted to individual strength and endurance. The small calves of many persons are due as much to a lack of fat as to lack of muscle. One who is

EXERCISE FOR DEVELOPING THE UPPER LEGS.

No. 4. Assume position shown in illustration, placing the hands on the outer side of each leg. While pressing inward with the hands, bring the legs outward as far as possible. Continue the movement until the muscles tire. This exercise is especially good for developing the muscles of the outer side of the upper leg, though of course the crouching position tends to round the knees and develop all the muscles of the upper leg.

too thin—whose legs do not carry enough adipose tissue—may find herself with a leg that is not at all pleasing in appearance if she does not add to her fat as well as her muscle. It may look as if it were overdeveloped muscularly, when in reality the muscles are only what they should be but look too large because of the absence of the requisite amount of fat. Men and women who are thin should follow the treatment for *Emaciation*, page 2028, Volume IV, in conjunction with any special leg exercises.

Undeveloped calves in the vast majority of both men and women are largely due to the wearing of improper shoes. The little walking that is done, because of such shoes, does not benefit the muscles of the lower leg as it should. Narrow, pointed shoes conduce to outward toeing, and the calf muscles can only be fully used when the toes are directed straight ahead. High heels reduce the action of the foot to a mere fraction of its normal range. So the first concern of all should be to wear proper shoes, not only for the sake of their calves, but also for the sake of their feet. Such shoes must be broad across the toes and balls, straight on the inside edge, low-heeled, and of soft leather.

The special exercises for the lower legs which I am providing here include movements for the flexing muscles of the front of the legs, or in other words, those which raise the toes, although naturally those of the calf are the more important and more powerful, since they raise the weight of the entire body on the leverage provided by the bones of the foot. It is upon these muscles that the springiness of the stride depends, which explains why one who is lacking in the development of these muscles can never walk with the least semblance of grace. A good walk has a little of this elastic quality, and is the means of avoiding a great deal of jar to the brain and general irritation of the nerves. Without this action of the calves in walking one would never rise on the toes; he would be compelled to hobble along after the fashion of the man with broken-down arches of the feet, or, in other words, like one with wooden legs from the knee down. Walking on your heels will give you a clear idea

EXERCISES FOR DEVELOPING THE UPPER LEGS.



No. 5. Stand erect with left foot far forward. Now bend left leg as far as you can, as shown in above illustration. Straighten left leg and continue movement until slightly fatigued. Take the same exercise with the right leg forward. For muscles of the hip and upper leg.



No. 6. Stand with feet far apart. Now slowly bend right knee and bring weight over to the right leg as shown in above illustration. When rising make the left leg assist as much as possible. Same exercise to the left. In this exercise the straight leg should be made to assist as much as possible each time you arise. If these instructions are followed this exercise uses very strongly the muscles on the inside of the upper leg.

of the gait that one would be restricted to without the calf muscles and the possibility of rising on the toes, or more strictly, upon the ball of the foot, in walking.

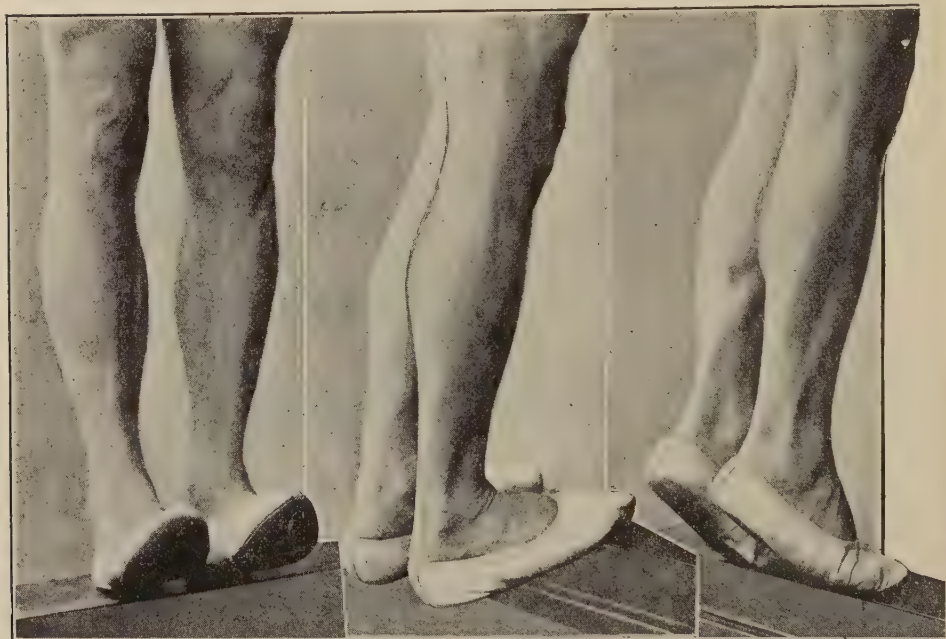
The importance of a full and vigorous development of these muscles, therefore, is manifest. Like the thighs, they should be stronger than mere walking requires even for the purpose of good walking. Even a moderate weakness of the calves will necessarily interfere with the freedom and grace of the stride.

Skating on ice is a good exercise for the lower leg. It requires a strong ankle to keep the skate firmly in the right position and this means strong muscles of the lower leg, not so much the large muscles of the calf as those which have to do with bending the foot sideways, that is, inward and outward. Skating is peculiar in its value for strengthening these particular muscles.

THE LUNGS.—[See also *The Chest* in this chapter, and *The Respiratory System*, Chapter X, Vol. I.]—Breathing is the first and the last act of every individual, and it might be presumed that between the breath which expelled his first cry and that which died away in his last gasp he surely had fully learned how to respire. Nevertheless, hardly one person in a hundred breathes properly. The rest breathe only to a limited extent of the possible capacity of their lungs, and so get only a limited power out of that human engine, the body. Their vitality is a minor fraction of what it should be. In short, they are only half alive, missing the great joy which springs from a consciousness of full mastery of their physical powers.

A grown-up male of average bodily development has usually in his lungs about two hundred cubic inches of air. An ordinary inspiration, such as is made by people unversed in taking care of their bodies, accounts for about thirty cubic inches of air. But inflate the lungs as much as you possibly can, and you draw in some one hundred and thirty cubic inches of air, or one hundred inches more than you do with a "quiet" breath. Now, when you inhale but thirty cubic inches of air and exhale it quietly, only that same quantity leaves your lungs. But

EXERCISES FOR THE CALVES.



No. 1

No. 2

No. 3

No. 1. Secure a block of wood of some kind that will raise you about four inches from the floor. Now stand on this with the heels, the toes extending over, and reaching down as far as possible with the toes in the manner shown in Photo No. 4 of this series. Now raise the toes as high as you can, as shown in Illustration No. 1. Repeat until tired. This is a splendid exercise for the flexor muscles of the front of the lower leg.

No. 2. Stand on the extreme edge of the block with the toes, as illustrated, allowing the body to drop as far as possible. Now rise slowly as high as you can to the position illustrated in No. 3, sink back again and repeat the movement until tired. A strenuous exercise for the large muscles on the back of the calf.

No. 3. Standing with the toes resting on the block, as shown, roll the feet until the body rests on the outer sides of the feet. Then roll the feet in the opposite direction until the weight is resting on the inner sides of the feet. Continue back and forth until tired. For muscles on inner and outer sides of calves.

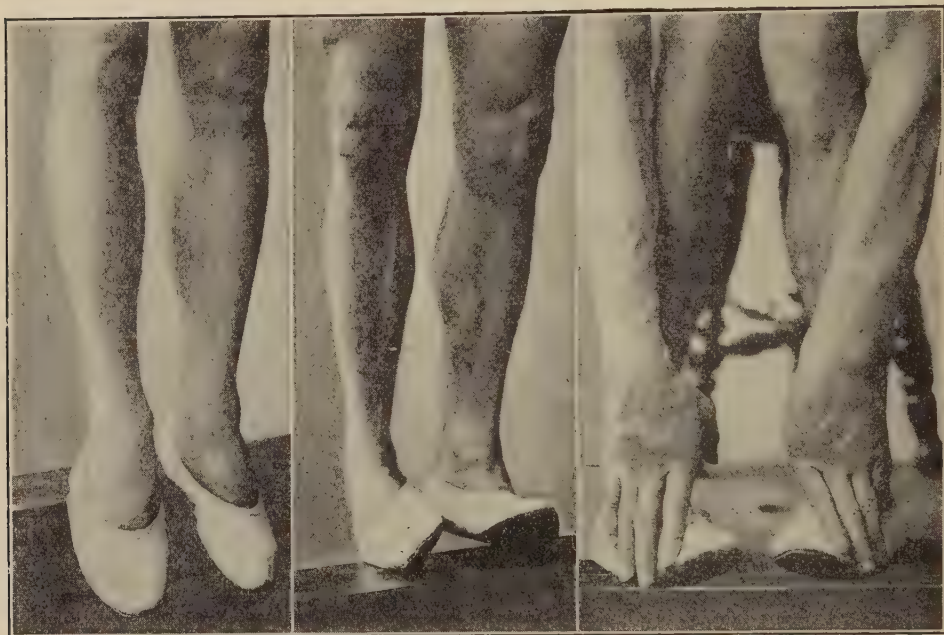
a strong expiration of air will relieve the lungs of some hundred cubic inches of more or less impure air that would otherwise linger in them to your harm. And as the ordinary quantity of air that belongs in the lungs must be made up at the next inspiration, pure air takes the place of the impure that has been gotten rid of by the forced expiration, and the blood throughout the body is much benefited thereby.

Strengthening the lungs and increasing their capacity for air are accomplished by one and the same means—the studied practice of deep breathing in the open air. Fill your lungs as deeply as you can, and you cause the ribs to rise and to bulge forward. The intercostal muscles facilitate this expansion of the chest, one rib being pulled upward and driven forward by the same movement of the rib above it. The diaphragm does its share by rising and forcing the lungs to expand outward. The ribs are obliged to accommodate themselves to the movement. The intercostal muscles become stronger through this constant exercise, and the costal cartilages are forced to stretch in order to accommodate this new demand on their expansion. In time, by repeated exercise, the cartilages permit of great increase in size of the cavity in which the lungs rest. And the lungs, both on account of the work of their own muscles and of that of the greater amount of chest space in which they lie, become larger and more enduring, while the heart is benefited, as has already been described, and the effect for good extends to the remotest tissues of the body.

To get the full benefit of breathing see that you are surrounded so far as possible with pure air. Be out of doors as much as you can, and, when you are indoors, secure good ventilation for the room.

Breathing in a confined room renders the air foul by converting the life-giving oxygen into the asphyxiating carbonic-acid gas. Your body is giving off vapory emanations which, even though slight, befoul the air nevertheless. You may be reading or working by the aid of a lamp, and the combustion that goes on in it is making the air more and more foul. In

EXERCISES FOR THE CALVES.



No. 4.

No. 5.

No. 6.

No. 4. Stand on the block of wood with the heels, as illustrated, then roll the feet first to the *inside* and then to the *outside* in a manner similar to that in No. 5. This is a variation of the exercise for the same muscles.

No. 5. Standing flat on the soles of the feet, turn the feet outward until the weight of the body rests on the outside edge of the soles of the feet. Repeat until tired, then reverse to inside edges. For muscles on inside and outside of calves.

No. 6. Seat yourself on a chair. Now, reach down and place your hands on the outer sides of the toes, as shown in the illustration. Now, bring the toes outward as far as you can, pressing against the movement slightly with the fingers of the hand. Continue the exercise back and forth until tired. For the twisting muscles of the calves and upper legs.

order to keep warm you have a radiator, heater, stove or grate going, each of which is taking oxygen out of the air. Throw open the windows then. Let in the pure air every moment that you are in the room. Breathe deeply. Every breath taken should be so full and so far-reaching that it goes to the uttermost recesses of the lungs. The lungs are filled with impure venous blood that needs purification by oxygen. And the blood, even after it has been made pure, needs oxygen to carry back to all the tissues of the body.

Start with a normal pair of lungs, and breathe deeply of pure air all through your life, and tuberculosis, or any other pulmonary disease, becomes an impossibility.

Cultivate the habit of carrying the head erect, with the shoulders thrown back, whether you are walking, standing or sitting. If the shoulders are allowed to bend forward, and the chin to droop, the lungs cannot expand as they should. Experiment a little with the shoulders and chin thus placed and you will appreciate the harmfulness of the position to the full.

Photographs on pages 802 and 803 illustrate the proper attitude to take and proper movements to make in exercises in deep breathing, that is, breathing which brings the air down into the farthest recesses of the lungs, inflating every cell, and which expels it again so thoroughly that every cell is collapsed. The movement should mainly be in the abdominal region and only slightly in the bony framework of the chest walls. The cultivation of an unusual "chest expansion" is more largely a "stunt" than a genuine athletic achievement.

Right here is the place to warn readers against the baneful habit, recommended by many athletes, of holding the abdomen drawn in as far as possible at all times in walking or standing. This is unnatural and injurious. It interferes with the digestive process, as well as with free and natural breathing. The abdominal wall should be relaxed and allowed perfect freedom to expand and contract with the downward and upward movements of the diaphragm essential to proper breathing.

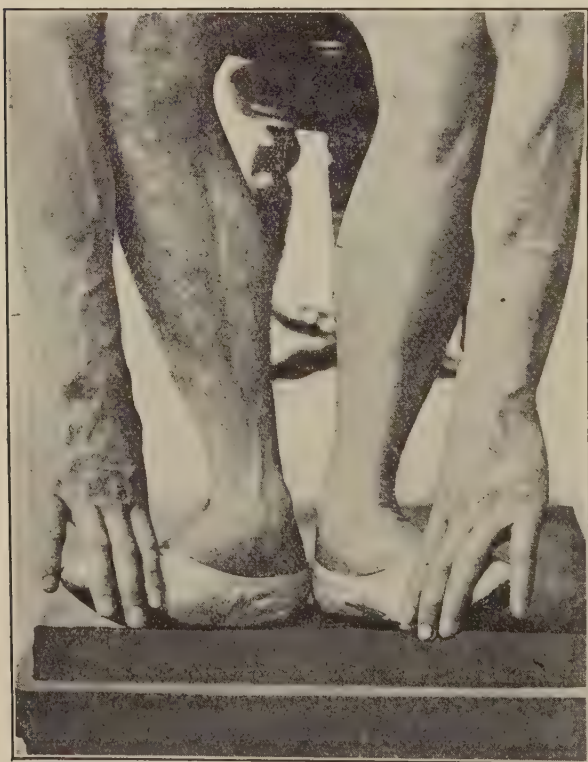
In filling the lungs to their greatest capacity while taking

breathing exercises, it is always well to first force out all the air you possibly can, and this requires you to draw in the abdomen as far as possible. Also, while making special movements that bring into play the chest muscles, a deep, full breath retained for a few moments with rigid abdomen will tend to force the air into every cell of the lungs, and thereby expand the chest and be of general benefit. Under ordinary circumstances, however, the abdominal wall should not be made tense and rigid, or held in.

Do not for a moment suppose that deep breathing is to be practiced only as a brief spell of exercise each day. Breathe

deeply all the time, for the more you do so, the longer you will live and the better will be the health that you will enjoy.

The first thing that you ought to do when rising in the morning is to go to an open window—or, best of all, right out-of-doors—and there take in a great number of full,



EXERCISE FOR THE CALVES.

No. 7. Seat yourself on a chair and place hands on the inner sides of the feet while turned far outward as shown in illustration. Now, bring the toes of the feet together, pressing slightly against the motion with the fingers. Continue until tired. For the twisting muscles of the calves and legs and upper legs.

deep respirations. It is possible, and not only that but necessary, to combine deep breathing with all muscular exercise. When you begin such exercise, be sure to assume a correct standing position, with chin well up and the chest given every opportunity to expand, and breathe deeply and regularly for at least three full minutes. Also pay heed to your work, in order that you may go through all of the movements with vim, accuracy and precision, but at the same time remember to *keep on breathing deeply* all the time that the muscles are being brought into play.

As often as you stop the muscular work, remember to continue the deep breathing. Your fatigue will disappear the more quickly if you do this. And always bear in mind that the active employment of the muscles creates a demand for more oxygen in the blood.

If you are in a perspiration and intend to bathe, it is an excellent idea to breathe deeply and cool off somewhat before you come in contact with the water.

While every muscular exercise may be combined with deep breathing to the profit of both lungs and the part of the body exercised, the following exercises are recommended as particularly helpful to the development of lungs and chest.

THE NECK. *How It May be Developed.*—Perhaps there is nothing more unsightly or unwholesome to behold than a scrawny, undeveloped neck. Of all undeveloped parts, this is the most painfully conspicuous, and furthermore offers to the beholder a sort of index of the vitality and general physical condition of the individual. A vigorous, well-set neck indicates not only a good muscular development of this part itself, but strength and energy in the entire body. It means a good, strong spine, well supported and reinforced, whereas a full throat indicates a large open thorax, with good breathing possibilities, and large arteries supplying blood to the brain, with plenty of room for them. All this, as one will perceive at a glance, means vigor and vitality.

It is true that the building of robust health and general

EXERCISES FOR THE NECK.



No. 1. A simple neck exercise, bringing the head far forward and then far backward. It may be intensified by tensing vigorously. Repeat until tired.

No. 2. Bring the head over to one shoulder without turning or twisting, as far as possible, tensing all muscles, if desired.



No. 3. This is similar to the last exercise, but with resistance added. With each hand take hold of the other side of the head, reaching over the head, and then pull the head over to the farther shoulder against the resistance of the hand. Repeat on each side until tired.

No. 4. Turn the head first far to one side and then to the other, keeping it erect at all times, and tensing muscles if desired to make the exercise more vigorous. For sterno-mastoid muscles.

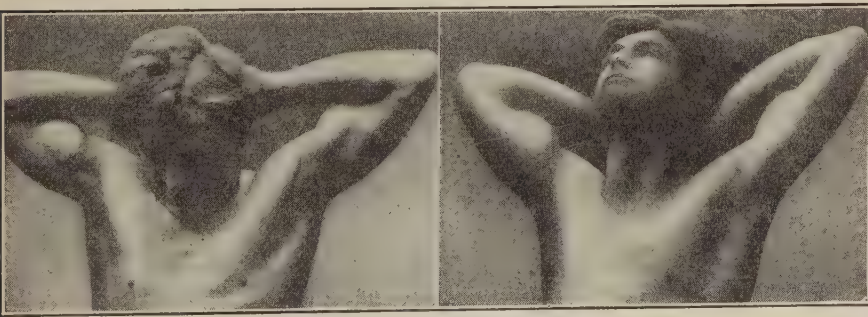
bodily vigor will naturally tend to enlarge and beautify the neck, giving it proportions in harmony with the rest of the body, but at the same time special exercises for the neck itself will help very greatly, not only in developing the muscles of this part, but in strengthening the upper spine. Such special exercises, naturally, become an urgent necessity in the case of special defects or weaknesses of the neck, and the exercises presented here will not fail, if persisted in, to round and fill out every part of the neck, giving such a degree of development and symmetry as anyone might well be proud of.

In my discussion of the Nervous System, in Volume I, I have shown the necessity for a strong neck and a powerful



EXERCISES FOR THE NECK.

Nos. 5 and 6. Showing two positions of the same movement, a resisting exercise for the neck. Placing fingers on forehead, with head far back, bring head far forward until chin rests upon the chest, resisting the movement with the fingers.



Nos. 7 and 8. First placing the clasped hands back of the head, the latter bent far forward, bring head far back as in Illustration No. 8, against the resistance of the hands.

back development for the sake of maintaining vigor of the spinal cord and nervous system and indicated how the nervous system may be stimulated and energized by exercises which bring the blood to these parts and strengthen not only the muscles of these regions but also all of the adjacent tissues. The muscles of the back and of the neck, therefore, should always receive special attention, and these parts should be strengthened together. These exercises for strengthening and developing the neck, if persistently followed, will result in helping the whole body and give exactly the sort of treatment for powerfully invigorating this



EXERCISE FOR STRENGTHENING THE NECK.

Nos. 9 and 10. Showing two positions of a vigorous exercise for the neck. First getting down on hands and knees, and placing head on a pillow, raise hands and knees from the floor and lift the body as high as possible, with weight resting on head and feet. Return to first position and repeat until tired.



EXERCISE FOR THE SHOULDERS.

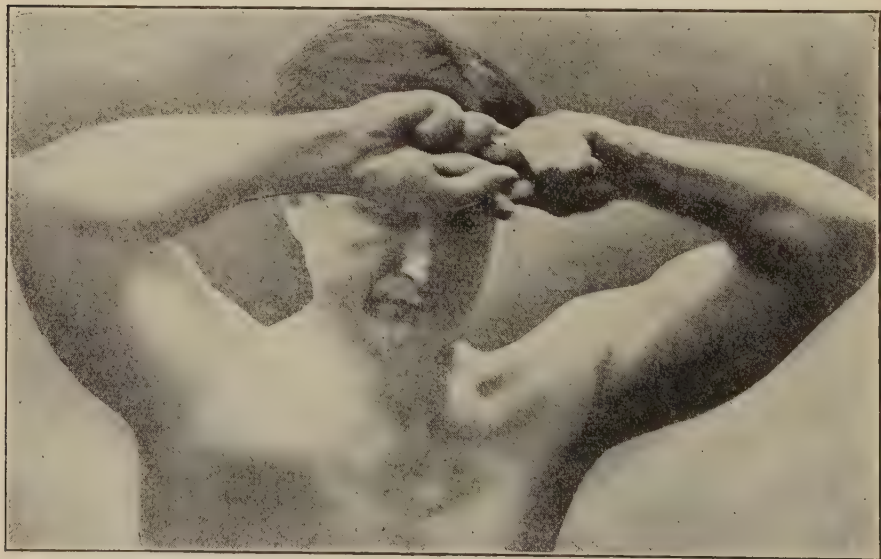
No. 1. First bring the shoulders as far forward and downward as you can, and also bring the head slightly forward. Now, with hands grasped together tightly, slowly bring the shoulders and the head backward as far as you can to the position shown herewith. Take this exercise slowly, and with the muscles strongly flexed. This is especially valuable for remedying round shoulders and will be found to affect very quickly the muscles that are used in maintaining a proper position of the shoulders. Continue the exercise each time until the muscles are thoroughly tired. Frequently when the shoulders are in a normal condition they still have a round appearance if the muscles at the back of the neck are not developed. This exercise of the neck will be inclined to remedy this defect.

part of the spine. In this way he will not alone accomplish the very greatest possible results in the development of the neck itself, but he will so add to his nerve-energy that it will be possible to acquire a much better development of other parts of the body.

If a long, thin and puny neck is distasteful to behold, it is no less so than one which is gross through the presence of a heavily sagging double chin and the accumulation of other massive rolls of fat. The back of the neck under such conditions is brutish and ugly, while the throat is shapeless and disgusting. All of these exercises, however, will work wonders in restoring the symmetry and character of the neck, and though they should be taken up gradually and with some care, yet with persistence and a progressive increase of vigor in their execution they will before long surprise every one with the improvement effected.

In all exercises for the neck it is essential that there be as much action as possible, or, in other words, that each movement be carried as far as possible. It is not sufficient that the muscles act against great resistance, but there should also be such complete flexion of the neck as will involve a certain amount of stretching of the muscles. In this way the most perfect results will be achieved, and grace as well as strength will be acquired.

THE SHOULDERS.—*How to Strengthen and Develop Them.*—In my general discussion of *Corrective Exercise* in the introduction of this chapter, I have made special reference to round-shoulders and their correction, and would refer the reader to the remarks made there. Round-shoulders are the result of a careless and improper position or carriage of the upper body, and primarily of the weakness of the muscles of the back and shoulders which leads to this drooping, careless at-



EXERCISE FOR THE SHOULDERS.

No. 2. Hooking fingers together in the manner shown, pull outward hard for a few moments at a time. This should be varied from position in front of forehead, to position in front of throat or upper chest, and position in front of stomach. Repeat a number of times.

titude. In these exercises for correcting round-shoulders a twofold purpose is accomplished, that of bringing the shoulders back to their proper position at the same time that all of the muscles concerned are strengthened and developed to a vigorous degree.

The muscles of the shoulders are so much involved in most of the movements of the arm that their fullest development is essential to all-around strength of the body. One could accomplish little in any kind of work or athletic activity with weak muscles in these parts. All backward and forward movements of the arms depend not upon the muscles of the arms themselves (except for the deltoids, which might also be regarded as shoulder muscles), but upon the shoulder muscles and the complementary muscles of the upper chest, sometimes called opposing muscles because they serve to draw the shoul-



EXERCISE FOR THE SHOULDERS.

No. 3. Locking fingers of both hands behind the head, pull outward hard with both arms. A very effective exercise for the shoulders.

EXERCISES FOR THE DIGESTIVE ORGANS.



No. 1. Seated on the floor, with legs wide apart, hands on hips, bend far first to one side, then to the other. This has a good influence not only upon the stomach and liver, but upon the other internal organs as well. Repeat until tired.



No. 2. Sitting on the floor with hands clasped behind the head, as illustrated, let the upper body lean backward to the position shown in this photo. Then—(See next photo.)

ders the other way, or in other words, forward. All pulling backward with the arms, as in rowing, in tug-of-war or in pulling the arms apart, brings into play these muscles, and naturally such exercises would help to develop them.

It is a very common thing to express one's admiration for the splendid physique of a well-built man by making comment upon his "fine, broad shoulders." In other words, broad shoulders serve as an indication of great physical power even to the indiscriminating eye. Certainly they are responsible for much of the robust beauty of a perfectly and powerfully developed figure. And probably one of the first things that the weakling desires to accomplish in improving his physique and his appearance is to broaden and develop his shoulders.

It is true that to a large extent the breadth of the shoulders depends upon the bone structure of the body, and that one cannot materially enlarge the skeleton after maturity. One can accomplish something in this direction, but he cannot widen the shoulders several inches if his skeleton is narrow by nature. What he can always do, and should do, is to develop the muscles of the shoulders perfectly, and then, whatever his build, he will enjoy a symmetry of this part of the body which will improve his appearance and give him vigorous strength. The shoulders, when well developed, will be filled out and well rounded, the deltoids will stand out like snug caps on the outside of each, and they will carry with them the suggestion of both strength and beauty, providing, of course, that other parts of the body are not neglected.

In a great many cases the bony structure is suited to great breadth and power, but the shoulders appear narrow because of lack of development, for one thing, and because they are rounded and droop forward. In this forward, drooping attitude they cramp the chest and give rise to other deleterious conditions, but they also give the body a comparatively puny look. The diligent practice of exercises which will bring them back to their normal position at the same time that they strengthen them, will restore their normal breadth and suggestion of power. This will also give the chest more room,

EXERCISES FOR THE DIGESTIVE ORGANS.



No. 3. Flex the body far forward, as illustrated here. To be of real value, this exercise must be performed conscientiously, the body bending just as far forward as it possibly can. Return to position in No. 2, and repeat, continuing until tired. If it is desired to make it more vigorous, as will be the case with advanced pupils, the exercise should be varied by first lying flat on the back.



No. 4. Lying first on the back and with hands at the sides, raise the legs, bringing them up and back over the head to the position illustrated, touching the floor with the toes back of the head. If this is too difficult, at first, then simply bring the feet back as far as comfort will permit. Repeat until tired.

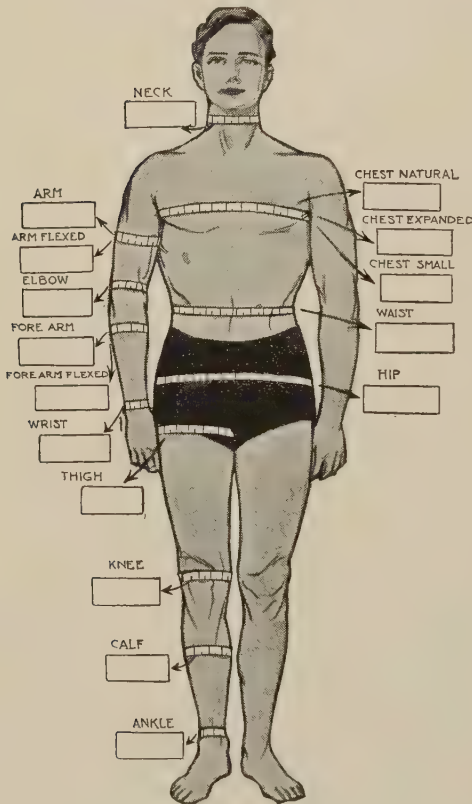
EXERCISES FOR THE DIGESTIVE ORGANS.



Nos. 5 and 6. Lying first flat on the back, with the arms outstretched as in the upper photograph, quickly and vigorously flex the body at the hips, bring the legs up nearly to the perpendicular, and raising the arms and back at the same time so that the finger tips may touch the toes, as in the lower photograph. Do not attempt to hold this second position, but drop back immediately to the first position and repeat. This is a very vigorous exercise for the abdominal muscles, but must be done smartly to be most effective.

tending to cause it to expand, and will also do much to overcome any tendency toward prolapsus of the digestive and other functional organs, which is usually the result of improper carriage or position. The position of the chest depends so much upon the shoulders that it is especially urgent, for this reason, not to allow the latter to become weak or to form the habit of drooping forward.

In connection with the movements illustrated on pages 822



This diagram shows at what points the measurements of the body should be taken. The reader should compare his own measurements with those given in the table on page 833.

to 827 for this purpose, I wish to refer to the exercises illustrated on pages 828, 830 and 831. These will be of great assistance in strengthening the entire back, shoulders and neck, and especially are they valuable as exercises for the digestive organs.

PROPORTIONS OF PERFECT DEVELOPMENT.—

To students who take up physical culture as a science and get beyond the rudimentary principles, Anthropometry, the measurements of the human body, becomes an interesting subject. Many see only its esthetic or artistic side; but, really, this is outweighed by its therapeutic importance.

Obviously, therefore, a single standard is not sufficient; for men differ as greatly in bony

framework as they do in stature. The best that any table can accomplish in this respect is to give the ideal weight and the muscular girths for various heights of men and women. The ideal figures for those with extra heavy skeletal development will be somewhat greater, and for those exceptionally light boned, somewhat less than the figures shown in the table.

The following tables of ideal measurements have been worked out by the staff of *Physical Culture*, and are truer standards of ideal development than those based on mere averages.

It should be obvious to anyone familiar with the fact of the general poor development of the human race that averages are very inadequate standards and, if held up as ideals, they would only tend to mediocrity for all. On the other hand, careful investigation revealed the fact that to pick a single standard of perfection and then make calculations therefrom for different heights, will not give the correct figure for various statures.

If this table is studied, it will be seen that the girths or circumference measurements do not increase nearly so rapidly as do the heights. In other words, the short man is naturally heavier built in proportion than the tall man, and any standard of measurements that failed to take this fact into consideration would be a standard that would be quite unattainable for tall men, and it would set too low a standard of girths for short men.

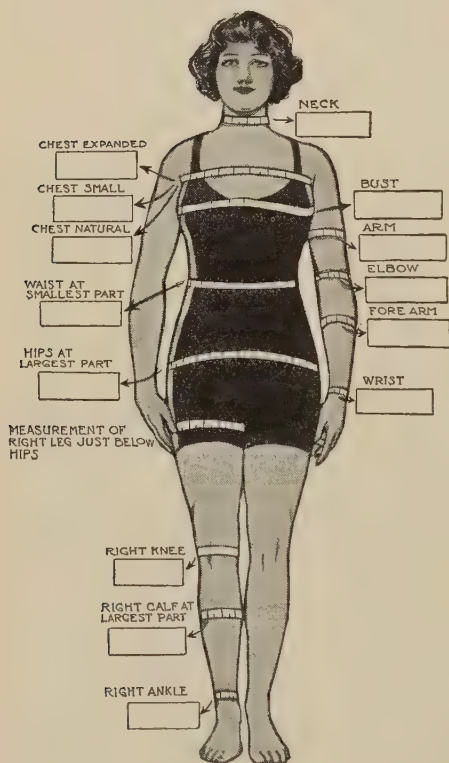
PHYSICAL CULTURE TABLE OF IDEAL MEASUREMENTS FOR MEN

Height in feet and inches, weight in pounds, girths in inches
and tenths of inches

Height	Weight	Neck	Upper arm	Fore-arm	Chest	Waist	Hips	Thigh	Calf
5 3	143	15.4	13.2	11.9	41.2	31.0	38.0	22.4	14.3
5 4	147	15.5	13.3	12.0	41.5	31.2	38.3	22.5	14.4
5 5	151	15.6	13.4	12.1	41.7	31.4	38.5	22.6	14.6
5 6	155	15.7	13.5	12.2	41.9	31.6	38.8	22.8	14.7
5 7	159	15.8	13.6	12.3	42.2	31.8	39.1	22.9	14.9
5 8	163	15.9	13.7	12.5	42.4	32.0	39.3	23.0	15.0
5 9	167	16.0	13.8	12.6	42.6	32.2	39.6	23.1	15.1
5 10	170	16.1	13.9	12.8	42.9	32.4	39.9	23.2	15.2
5 11	174	16.2	14.0	12.9	43.1	32.6	40.1	23.4	15.4
6 0	178	16.3	14.1	13.0	43.4	32.8	40.3	23.5	15.5
6 1	182	16.4	14.2	13.1	43.6	33.0	40.6	23.6	15.6

Formerly, tables were published which were based on so-called "ideal proportions" for men of medium height, and were then figured out in the same proportions for the short and tall men. According to this standard, a short, a medium, and a tall man should, when photographed and when the photos had been reduced to the same size, be exact replicas. Such a conception is purely theoretical and does not conform at all to the natural tendencies of human development.

As stated above, a short man is relatively a heavier figure,



In this chart are shown the points of the body at which measurements of a woman should be taken. When these are made compare with the table on page 835.

but not proportionately so. The girth of the chest, for instance, only varies about three inches with twelve inches difference in height. This fact may make it clear why strong men are frequently men of only medium height, since the natural limits of the muscular girths of tall men are only a trifle greater, and these men must work against a handicap of reduced leverage from an increased distance through which the action of the lifts must occur.

The aim of these ideal measurements is to set a standard for development of muscle that shall be equally fair to men of any stature, and will indicate the development for each stature that com-

bines strength and beauty without any excess development that would be considered abnormal.

The table for women takes recognition of the same principle of the naturally heavier form in proportion to height of the short individual. Since the average woman is very poorly developed, women should attempt to attain a superior degree of muscular development; yet the muscular increase to give woman her ideal figure is not as great as it would be for men.

PHYSICAL CULTURE TABLE OF IDEAL MEASUREMENTS FOR WOMEN

Height in feet and inches, weight in pounds, girths in inches
and tenths of inches

Height	Weight	Neck	Upper arm	Fore- arm	Chest	Waist	Hips	Thigh	Calf
4 11	110	12.1	10.3	8.9	32.0	24.6	35.6	21.6	13.1
5 0	114	12.2	10.4	9.0	32.2	24.8	35.8	21.7	13.2
5 1	118	12.3	10.5	9.1	32.4	25.0	36.0	21.8	13.3
5 2	122	12.4	10.6	9.2	32.6	25.2	36.3	21.9	13.4
5 3	126	12.5	10.7	9.3	32.8	25.4	36.5	22.0	13.5
5 4	130	12.6	10.8	9.4	33.0	25.6	36.8	22.1	13.6
5 5	134	12.7	10.9	9.5	33.2	25.8	37.0	22.2	13.8
5 6	139	12.8	11.0	9.6	33.4	26.0	37.3	22.4	13.9
5 7	143	12.9	11.1	9.7	33.6	26.2	37.5	22.5	14.0
5 8	147	13.0	11.2	9.8	33.8	26.4	37.8	22.6	14.1
5 9	152	13.1	11.3	9.9	34.1	26.6	38.1	22.8	14.2

Woman is naturally smaller than man, as indicated by her average height. She is also naturally lighter for the same height. Take for illustration a woman of 5 feet 4 inches and compare her with a man of that height. The ideal weight for the woman is given as 130 and the man as 147. In matters of proportion, the man has relatively larger neck, arms, and chest, and the woman relatively heavier hips, thighs, and calves. The old idea that a man's neck, biceps and calf should measure the same is not correct and can only be obtained by excessive arm development and neck and leg neglect. A man's neck should be the largest, his calf second, and the arm smallest, but with a woman, the calf should be the largest.

Five feet 3 inches was formerly considered the ideal height for women, but some claim this figure was below the true ideal; and the fact that the average female stature has increased

some two inches during recent years of revived attention to physical culture, would seem to justify their stand.

The average height of the human race is a trifle over 5 feet 5 inches; Baxter gives the average of the American male as 67.67 inches. Galton gives 67.50 for the English. The Chinese run only 65.35 and a certain tribe of Bushmen even lower, 52.75.

As one of the measurements of vital strength the sitting height is important. As a rule a trunk long in proportion to standing height, is a good indication of organic power.

THE STOMACH AND HOW TO STRENGTHEN IT.—The chief organs of digestion are the stomach and the small intestine, where, with the aid of the juices, gastric and intestinal, which are respectively secreted in these organs, food is prepared to enter the blood in the forms of chyme and chyle.

The fact that the stomach and small intestine are essentially muscular organs is not generally recognized because their muscular action is *involuntary*—not like the muscles of the arm, for example, which we can cause to contract by a conscious exercise of the will—and gives no evidence of its operation by sensation, such as the involuntary action of other organs does—that of the heart, for example. The stomach and small intestine go on working whether we are awake or asleep without our slightest consciousness of their efforts. The only sensation which we can experience in them is caused by the weight of superfluous food, or the pains of indigestion. Indeed, a good stomach is that which gives no signs of its existence.

The involuntary muscles of the stomach, controlled by the nerves of the sympathetic system, set up a churning movement that continues from the instant that food enters the organ until the last morsel of it has been expelled. Without this churning there could be no proper admixture of the gastric juice and the food.

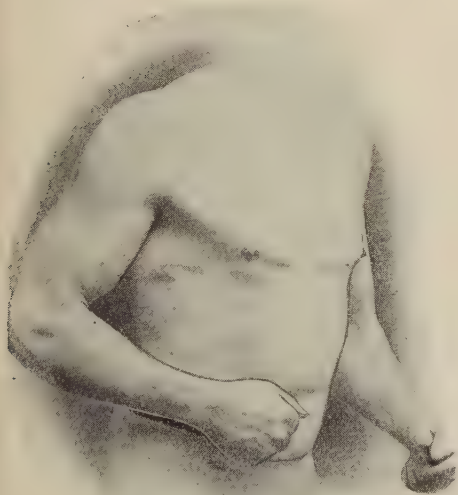
The same state of affairs prevails in the small intestine. Here the movement is controlled by a long series of ring-like muscles that alternately contract and relax, forcing the par-

tially digested food along through the intestine and mixing the bile and pancreatic juice with it.

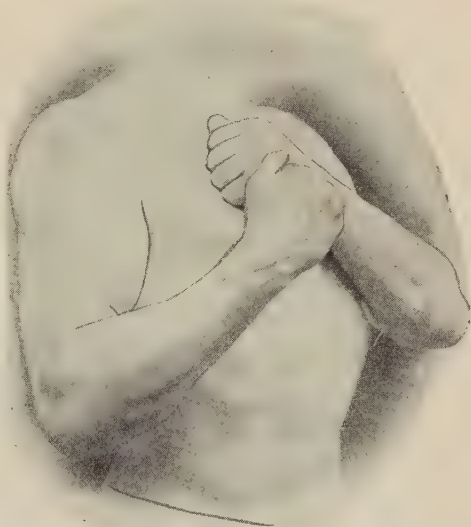
It is apparent, then, that if the power of these involuntary muscles is less than it should be normally, just so much is the digestive ability of the body lessened. For this reason one of the first steps in increasing vital power, which is based upon good digestion, must be the strengthening of the muscles of the stomach and of the small intestine.

Now, the only way of increasing the strength of a muscle is by exercise. But how can an involuntary muscle be exercised? It may occur to you that, in the case of the stomach and small intestine, these may be forced to increased effort by giving them more food than they are demanding by hunger. This, indeed, has been advocated, but it is an unnatural and, hence, an injurious practice.

The proper method of exercising all involuntary muscles is by exercising the voluntary muscles that are in close connection with them, thereby giving vital power to the particular



Close the hands as shown in the illustration, and strike the lower part of the abdomen with the right and left hand alternately, tensing the muscles of the abdomen vigorously while taking the exercise.



With the closed hands strike the sides of the abdomen, beginning with the waist line, and gradually striking upward as far as you can reach, tensing the muscles of the abdomen vigorously while taking the exercise.

region of the body, and so stimulating the involuntary muscles to increased action. Now, in the abdomen there are a great many muscles of the voluntary kind, ranging from those that are thoroughly under the control of the will, to those that are partially under this control, and which can be brought thoroughly under control by practice. This you can prove by breathing deeply and rapidly and forcing your abdomen to rise and fall just as you wish it to. It is possible, even, to make these abdominal muscles move while breathing is practically suspended.

A little investigation and thought will show you what forms of exercises are needed for furthering the strength of the involuntary muscles of the stomach and of the small intestine. Any movement of the abdomen that is quick enough and vigorous enough to constitute exercise answers the purpose.

As auxiliary to these exercises percussion of the abdomen should be employed to stimulate the flow of blood in the organs within. Tap the front and sides of the abdomen with the open hands or the fingers. Strike lightly and smartly, going over the entire external surface. Do not do this in a lackadaisical way, but with vim and thoroughness. At the same time avoid striking too heavily, since the aim of percussion is to harden, not to bruise, the delicate muscles. One method of percussion is illustrated on the preceding page. Naturally it would be unwise to attempt percussion when the stomach is filled. See also the illustrations on pages 800 and 801.

The man who is deficient in the development and strength of the muscles of this part of the body is at a decided disadvantage. If he is not suffering from some form of rupture, then at least he is subject to the danger of easy rupture at almost any time, and from a preventive standpoint this consideration alone should be sufficient to warrant measures for a vigorous development of muscles of this part of the body. In a state of vigorous development, the entire region of stomach and abdomen is walled in by a stout covering of muscular tissue, not only making rupture impossible, but giv-

ing tone to the internal organs and preventing tendencies toward sagging and prolapsus. These muscles will keep these organs in their proper place and thus enable them to perform their functions with the greatest possible efficiency. Considering the importance of the function of digestion and assimilation in the building of vitality and the maintenance of health, one really cannot afford to neglect these organs in the least respect. How many men and women are able to declare that their digestive organs, in their daily work, represent 100 per cent. efficiency? And yet no one should be satisfied with anything less, just as no one should be satisfied until he is assured that the development, strength and activity of every part of the body represents a full 100 per cent. efficiency.

A sense of weakness and laxity in the region of the stomach and abdomen is truly a deplorable thing, but yet just as unnecessary as it is undesirable. It is the most simple thing in the world to strengthen and develop these muscles, and I might add that one will probably find no other part of the body that seems to respond more quickly to the influence of exercise. The flabby condition will disappear, the tissues will become firm and the contour rugged. One will soon begin to take pride in feeling the well marked outlines of these muscles in their contracted state. And what is more, the sense of strength and power, in place of the sense of laxity and weakness, will make one fearless of disease or digestive disturbances.

It is true that the muscles of the external body are not directly concerned in the digestion of food; and that this is carried on first by the muscular action of the stomach itself, and later to some extent by the peristaltic and other small muscles of the intestines. But aside from the influence of strong outside muscles for supporting these organs and keeping them in their proper places, the energetic use of these external muscles indirectly invigorates the involuntary muscles of the inner body. The powerfully accelerated local circulation due to such exercise strengthens and improves all of the adjacent tissues and organs.

The student is naturally aware that in case of any weakness of the stomach it is nearly always necessary to make inquiry into the errors of diet which have probably been most to blame, and so to modify or correct the diet that the stomach will not be subjected to any undue strain in its work. With this advantage, the weakened organs will right themselves and gain strength accordingly, but in most such cases it is also best, indeed, we may say necessary, to adopt special measures for energizing and strengthening the stomach itself. This will enable one much more quickly to overcome any disorders of this kind, and the ideal method is exercise. By no other means can the same results be accomplished.

WEIGHT LIFTING.—The lifting of heavy weights is a form of exercise of great value in some cases and of questionable value in others. This depends chiefly upon the build and physical characteristics of the individual, but to some extent also upon the manner in which it is practiced. As in many other matters, there are right methods and wrong methods of weight lifting. The prejudice which has arisen in many quarters against weight lifting is the result of the irrational application of this form of exercise. If one is of a robust or stocky build, and bones are not too light, then he may profit by intelligent methods of weight lifting. If he is very light-boned, apparently intended by nature for the exercise of speed in his physical make-up, rather than for manifestations of prodigious strength, or in other words, if he may be compared to the race horse type rather than to that of the heavy draught horse, then he might do better to let weight lifting alone entirely.

The lifting of bar-bells or large dumb-bells is unquestionably adapted to the development of the greatest possible muscular strength, and it may be said that practically all of the famous and phenomenal strong men have cultivated their strength through this method, even though some of them later recommend or give instruction in other methods. The heavy iron bells offer that resistance which is essential to the most powerful contraction of the muscles and if one follows a system

of progression in weights, gradually adding one or two pounds as his strength increases, he will grow continually stronger until he reaches his maximum physical power.

Before attempting any form of weight lifting, it is indispensable that the student should thoroughly understand *how* to do so. Otherwise he may strain himself and acquire all kinds of errors of form. Furthermore, without knowing how to handle both the body and the weight, one will be able to lift only a fraction of that which he could comfortably handle, with the same strength, if he did know how. There are those who fancy that weight lifting is only a knack, and that it does not indicate real strength, but in this they are mistaken. It is true that the "knack" is necessary to accomplish anything, but one must also have the strength or he can do nothing. Knack cannot take the place of strength, for it absolutely requires just so much power to raise a certain weight. The knack means simply the concentration of strength in the most effective way, rather than the most disadvantageous use of it.

Weight lifting should never be taken up by the beginner in physical culture, for it should be regarded as a form of advanced training. After one has thoroughly strengthened and hardened every part of his body by ordinary exercises, then he is ready for the practice of weight lifting, if he desires, and it will then increase his strength still further, provided he uses such weights as will offer greater resistance than that supplied in the exercises to which he has been accustomed. For some muscles, gymnastic and resisting exercises may accomplish much more, as in the case of the muscles of the neck, or the *latissimus dorsi*, used for pulling the arm downward, in chinning, on parallel bars or flying rings. Weight lifting naturally has to do with pulling upward and pushing upward, although in this one may vigorously employ most of the muscles of the body.

It is not every one who wishes to acquire the phenomenal strength and development necessary for exhibitions in a circus or theatre, and even the prospective teacher of physical culture will not desire this. Perfect symmetry, grace and activity,

combined with normal vigorous strength, are better than the extremes of muscular bulk which some exhibiting strong men acquire. As a general thing, therefore, I do not advise trying to reach such extremes. They are not possible to every one anyway. Every one may be physically perfect along the lines of his own build, or as Nature has provided for him, but it is not every man who can ever acquire the power to raise two hundred and fifty or three hundred pounds over his head with one hand. Such men are born with unusually great possibilities of strength.

If one takes up weight lifting, therefore, it should be as an exercise and as a means of development, and not with the hope of some day startling the world with the execution of seemingly impossible feats. As in athletic sports, the aim should be physical benefit and pleasure, and not the making of a record, which is usually impossible, anyway. One should make up his mind in the very beginning that he will indulge in weight lifting with a certain moderation, and that he will use moderate weights, rather than those which will daily test his powers to the extreme limit. This moderation, in most cases, will develop the greater degree of strength, for in going too far one will overreach himself, and will defeat his own purpose. In his exercises he should stop before he is exhausted and should not attempt to lift within ten per cent. of what he judges to be his utmost limit. Remember that vitality is the all important thing, in strength development or in anything else, and if one attempts to lift a weight beyond his power to handle with pleasure and convenience, then he is using up too much nerve-energy. As in other exercises, if he feels a sensation of trembling afterward, he may know that he has exceeded the limits at which his expenditure of energy may prove profitable or beneficial in building still greater energy. Let him be warned thereby not to attempt so much again until he is far stronger.

Weight lifting may be termed a natural form of exercise, as compared with some of the ingenious and freakish methods taught by some correspondence instructors. In a natural state

the muscles have to do with moving the body itself, or some of its parts, or else with the handling of external objects. In short, the lifting of things is and always has been a fundamental part of everyday life. Weight lifting as an exercise is a natural development of this everyday activity in handling things. And for purposes of exercise it is not essential that one become a master of all of the little tricks in handling bar-bells, though they help to make it interesting. It will suffice for strength-building purposes to have a general knowledge of the fundamental principles, and this may be gained here.



No. 1. The use of the bar-bell is an ideal method of developing the most powerful degree of strength in the legs. With bar-bell resting across the shoulders as shown, standing first erect, bend the knees and lower the body to the squatting position illustrated. Since success in weight lifting depends very largely upon strength of the legs, this exercise should be practiced a great deal before taking up the regular feats of strength.

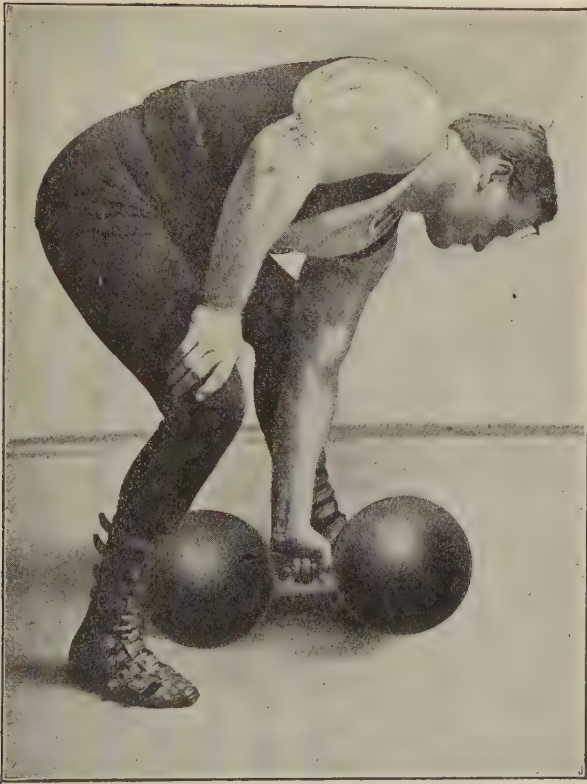
The fine technical points, as in wrestling or boxing, would best be learned from a personal instructor. Sometimes the practice of very simple exercises with a bar-bell will accomplish more in the way of development than the tricks, or feats of strength, as, for instance, in the matter of strengthening the arms. Most lifts in which the arms are employed ostensibly to do the work are really executed chiefly by the strength of the legs, or other parts, whereas in a simple exercise the novice would push up a bell of half the weight by sheer strength of the arm muscles, and in that way develop the arms.

I would therefore recommend, as the first thing on taking up the use of a bar-bell, the practice of the most simple movements for strengthening the entire body, using a bell of such weight that it can be handled comfortably and without strain, perhaps forty to sixty pounds, according to the size and strength of the individual. A bar-bell is preferable to a dumb-bell, because it can be used with one hand or both hands, while the dumb-bell is limited. The student who is strong enough or advanced enough to take up this work will already be familiar with a full system of free movements or calisthenics, and by using similar movements with the bar-bell, adapting them as



No. 2. A fine exercise with the bar-bell for strengthening the extensor muscles of the arm and also the muscles of the upper chest. Lying flat on the back, and with bar-bell held above the chest in the position shown, push straight upward to arms' length.

may be necessary, he can employ every muscle of the body. Movements which had come to be too easy can be made effective by the resistance found in the weight of a bar-bell. For instance, rising high on the toes becomes far more effective for the calves if one adds this extra weight. And so with other movements. I would especially suggest the following, using a bar-bell of forty or fifty pounds, or any weight that can be handled readily, and which permits of eight or ten repetitions of each movement comfortably.



No. 3. Method of picking up a dumb-bell, though in the case of a bar-bell to be picked up with one hand, or a very heavy dumb-bell, the palm of the hand should be forward, and the bell placed parallel with the line of the feet. Note especially the position of the back and legs, the back being held straight, and the body bent from the hips.

With bar-bell lying on floor, and the knees straight, pick it up and rise to standing position. Return to floor and repeat until only moderately tired. For the back.

Holding bar-bell resting on shoulders, back of neck, rise high on toes, repeating as necessary. For the calves.

Starting with same position, bell on shoulders, bend the knees and the lower body to a squatting position, rising and repeating. For upper legs.

With arms at sides, holding bar-

bell across the front of the body, hands in supination (palms turned upward or forward), flex the arms while keeping the elbows at the sides until the bar-bell is brought up across the front of the shoulders. Then vary the same movement by having hand in pronation (palms down). This should not be done too quickly, lest it be accomplished through momentum of a swing. If done slowly the bell will be raised throughout the whole movement by the contracting power of the muscles only. For biceps and forearms. This may be improved by curling or bending the wrists as much as possible during the movement.

From position in front of shoulders, hands in pronation (palms forward), push bar-bell slowly over head to arm's length, till arms are straight, and it cannot be stretched up any higher. Repeat until slightly tired. For deltoid and triceps, deltoid first part of movement, chiefly triceps for latter part. Do not do this with a jerk.

Lying on back, bar-bell across the chest, push straight upward with arms to arms'



No. 4. Position with weight high above head, in one hand. It is most important that one keep his eye on the bell at all times when it is above the shoulders, and it should be balanced above a point midway between the two feet.

length. An excellent exercise for triceps and pectoral muscles of chest.

Lying on back, with bar-bell across stomach or abdomen, heels doubled under the knees, raise the back off the floor and as high as you can, weight resting on shoulders and feet. Repeat until tired. For back and buttocks.

Standing with back straight, but bending forward at the hips, back parallel to the ground, pull bar-bell straight upward to the chest with both hands, lower to arms' length and repeat. If desired, forehead may rest on a table while doing this. For biceps and muscles back of shoulders.

The above simple exercises will employ in a general way all parts of the body, and it would be well to practice them for three or four weeks for building strength before attempting regular feats of strength in lifting. In executing all of these movements, be sure to stretch the arms as far as possible when extending, or when raising weight above the head, and to flex just as far as possible when bending arms or legs. In other words, make movements just as complete as possible, which should apply in weight lifting feats as well in these plain exercises. If one will rigidly adhere to this rule of complete extensions and flexions of all parts of the body, he need have no fear of becoming "muscle-bound" through the handling of weights. (See *Muscle-binding*, preceding chapter.) The muscles will retain their full length, and there will be no impairment of the movements of any part of the body. Perhaps in the case of extreme development from weight lifting, there may be some such interference, but it should be slight.

In taking up weight lifting, it would always be well to take some exercise for speed and flexibility to counteract the tendency to become slow. Weight lifting alone has a tendency to make the muscles slow, but hand ball, bag punching, sprinting, jumping, boxing and fencing will to a very great extent counteract this. There are numerous examples of powerfully developed men who are exceedingly quick and active in their movements. At the same time, it must be admitted that one who specializes in heavy exercise, even if he tries to cultivate

speed simultaneously by light quick exercises, can never be quite as fast as the man who is built for speed and who devotes all of his energies to its development.

In many feats of strength, however, it is well to combine a measure of speed with strength. The result will be the development of tremendous energy. Some moves in weight lifting require to be done quickly, otherwise they cannot be done at all. In a great many cases practically all of the work is accomplished by the quick energetic action of the large muscles of the legs, and the importance of the legs in this connection should be well kept in mind. Another most important matter is the necessity of *keeping the back straight* when lifting from the floor. In bending forward, bend from the hips, always, but with the back straight.

Raising a bar-bell to the shoulders is an easy matter when the weight is moderate, but above a certain point it will be necessary to use what is sometimes dignified by the name of the "science" of weight lifting. This means the "knack" or the concentration of strength to the best advantage. In lifting a heavy bell to the shoulders this means the use of the legs rather than merely the arms. Stand with feet well apart, perhaps a distance of the width of the shoulders, and take hold of the bar-bell with both hands just in front of the instep, or over the toes. In this way you will be well over the weight. The back should be straight, but the knees fairly well bent, so as to give a strong upward pull with the legs. Hands in pronation (palms down or backward). Now give a straight hard pull upward, with both arms and legs, though chiefly by the effort of the legs, and with as much quick momentum as possible, pulling the bar-bell up to the front of the neck and shoulders. At this point, just as it reaches the highest point to which its upward momentum will carry it, quickly bend the knees and drop down a few inches so that you can shift the elbows under the bar, instead of over. This should be done very quickly, and the forearms should then assume a perpendicular position under the hands. In short, the bar-bell will then be in front of the shoulders and it will only be necessary

to straighten the knees and rise to the upright position. In doing so, step back a step with the right foot, feet at right angles with each other. You are now well balanced, and ready to push weight above head. Hands will be bent slightly backward at the wrists.

Lifting a heavy bar or bell to the shoulders with one hand is accomplished by the same quick dip of the knees, and a similar forward hitch of the elbow at the right moment, by means of which the elbow and forearm may be brought directly under the weight. In starting for a one hand lift, however, the hand should be in position of supination (palm forward). Practice these movements thoroughly with a light weight until you have mastered them, before trying a really heavy weight, and then increase only gradually.

For strength of the arms, as said before, a slow push up is the thing. With a weight above a certain point, however, this is impossible, whereupon it will be necessary again to call in the use of the legs.

The jerk, as it is most commonly called, is the method by which one throws up or "jumps" up a bar-bell from the shoulders to arms' length above the head. Simply bend the knees so as to lower the body a few inches, and then suddenly straighten them with a jumping effect, thereby starting the bar-bell upward with great momentum. In many cases this momentum will be sufficient to send the weight all the way up, but in any case it should go up three-fourths or four-fifths of the way, in which event it is only necessary to finish straightening the arms to complete the movement.

With a weight above the head, there are two considerations which should *always* be kept in mind, since they are absolutely essential. The first of these is *perfect balance*. Keep the body directly under the weight, which means that the center of gravity should be above a point midway between the two feet. The second point is necessitated by the first, and requires that the lifter *keep his eye upon the weight* at all times when it is above his shoulders. Never for an instant take your eyes off the bar-bell or dumb-bell.

A compound jerk is necessary with an even heavier weight, with which the ordinary jerk will not accomplish the purpose, though this also should be practiced first with a moderate weight. Suppose that with the best possible effort in a jerk you can only succeed in giving the bar-bell enough momentum to throw it halfway up, or barely above the top of the head, and that the arms cannot push it up the rest of the way, then, just as it reaches the highest point acquired by its momentum, quickly bend or dip the knees a second time, dropping the body down under the weight far enough to enable you to straighten the arms under it. Once the arms are straightened, it will only be necessary to straighten the legs and rise up to the full standing position, watching the bar and keeping the balance carefully. This dip of the knees and getting the arms straightened under the bar must be done in an instant, though after this you can rise by straightening the legs slowly.

In executing the jerk the legs should act with great energy and speed, as though to throw the weight from the shoulders as high up as possible. The legs should be bent for this purpose only far enough to get the greatest possible power. To bend them too far would mean loss of power. In the second movement of the compound or modified jerk, however, for getting the arms straightened under the bar at the psychological moment, it may be necessary to bend the knees much more, indeed, just as far as may be necessary to drop down sufficiently to get the arms straight. And always keep in perfect balance.

The two-hand snatch is a spectacular and interesting feat by which the bar-bell is raised from the floor to a position at arms' length overhead in one continuous movement. It is of course done chiefly with the energy of the legs, though the back and arms help as much as possible. The back should be straight, bent forward at the hips when taking hold of the bar, and the legs so bent as to give the greatest possible upward pulling power. The lift is made quickly and with great energy, giving sufficient momentum right at the start to send the weight all the way up. In case the weight is so heavy that this can-

not be accomplished, then the legs must again be brought into play as in the second movement of the compound jerk. Suppose, for instance, that with the best effort the bar-bell can be raised only to the level of the top of the head with the first pull upward, then at that point the legs should be quickly bent and the body lowered so that the arms can be straightened under the bar, whereupon the legs can be straightened again and the upward passage of the weight continued without interruption, or at any rate without any apparent or noticeable interruption. If this is done smoothly and effectively it makes a beautiful lift, and all in one continuous movement.

The *one hand snatch* is similar to the two hand snatch except that it is done single handed, starting with palm turned backward. It is much more popular and more widely practiced. One can lift almost as much and it is more spectacular to see it done with only one hand. It is sometimes mistakenly called a "swing," but the swing proper consists of swinging outward and upward from between the feet, with straight arm, to high over head. The swing is available for limited weights only, and is of little value, except as an exercise for the back. In performing the one hand snatch with the right hand, for instance, the left hand may be placed and braced upon the left knee, helping to start the lift, the left arm swinging up and out on a level with the shoulder for balancing purposes, as the weight goes above the head. The same dip of the knees and straightening of the one arm is to be employed whenever necessary to complete the snatch, as in the two handed version of this lift.

The *one hand jerk*, similarly, is identical with the method of the two hand jerk, the bar-bell or dumb-bell being first balanced carefully at the shoulder, with the other arm outstretched. The movement of this, and those of the compound jerk, should be thoroughly mastered with an easy weight before attempting any such lifts with a weight that offers real resistance.

In pushing up a moderate weight with one hand, the strength of the arm is best brought into play if the body is held as nearly motionless as possible, or as consistent with

proper balance. But the weight may be put up easier, and a good exercise for the muscles of the sides afforded, by a certain sideways swing of the body. Using the right hand, for instance, with the dumb-bell at the right shoulder, first bend well over toward the right side, with the left arm stretched outward and slightly upward. Then bring the left arm down and swing the whole upper body well over to the left as you push the bell upward with the right hand. This exercise should be practiced with each hand.

The *bent press*, so-called, is a peculiar method of raising a heavy weight above the head with one hand. It is used with weights too heavy even for the jerk, and consists in causing the body to raise the weight which to the unsophisticated one may seem to have been put up by strength of arm merely. By this method Arthur Saxon has lifted 312½ pounds, probably the greatest authentic lift. Other greater lifts have been claimed, but without any reliable record. However, anyone may be well satisfied if he learns to put up in this way the equivalent of his own weight.

In commencing the bent press, with the right hand, for instance, though it should be learned with both hands, it is assumed that the bar-bell is at the shoulder, well balanced in the hand. First bring the weight well back of the shoulder, and with the bar parallel with the line of the back of the shoulders. With a long bar, in other words, the thumb end should pass back of the neck. An important thing throughout is to *keep the forearm absolutely perpendicular* under the weight. Starting from this position, gradually bend down toward the left side, keeping the eyes on the bar-bell, and turning the thumb end slowly forward, or in other words, turning the palm outward. As the body bends far down the angle of the right arm at the elbow will gradually widen to a right angle, and then, continuing, form an ever widening obtuse angle. The left arm, first bracing the body on the inside of the left thigh, will gradually slide down, and the bending of the body will continue until the left shoulder comes close to the left knee. Meanwhile, the right forearm, under the weight, has been kept

perpendicular and the arm is now almost straight. Having straightened it, with the weight thus above the body, one can straighten up and the feat is accomplished. In short, instead of pushing the arm up with the weight, the body is bent down under it until the arm is straight, or nearly so.

The bent press is usually a difficult thing to learn, and the student need not be surprised if he does not learn it in three months. It seems awkward and unnatural at first, but it is an efficient method, as is proven by the fact that one can lift infinitely more in this way than by any other one hand method. It should be the last thing to learn in weight lifting, and one should be very strong before attempting it.

There are a number of fancy tricks, but they are not essential and need not be considered here. Most of these regular feats may be best learned from a personal instructor, but if he is poorly qualified in imparting his knowledge to others, one may even do better by following the instructions given here.

CHAPTER III.

COMPETITIVE EXERCISES AND SPORTS.

IT may be said that there are two great general classifications of exercises, those of a special and systematic nature, for the sole purpose of building strength and developing the body, on the one hand, and those of an entertaining or so-called recreative nature, on the other. The latter take the form of play and are commonly indulged in primarily for the interest and pleasure to be found in them, though they are none the less valuable on this account for purposes of developing and promoting the general welfare of the body. Outdoor exercises of this character are particularly to be commended. It is with these and with all wholesome phases of outdoor sport that the present chapter has to do. The list is arranged alphabetically for convenience.

Before discussing these exercises and sports in detail, it is well to give some general advice on the subject of Training.

TRAINING.—The question of training in preparation for an athletic contest is one little understood by the novice, and one in which those with experience often go wrong.

Training really means such an amount and kind of practice in a special athletic event as will enable one to be at his best when competing in that form of sport, though in most cases true training should also include such other body-building exercises as will develop the strength and endurance necessary for the best success. It is in this respect that many athletes fail, and for this reason it is the first important point to be made here. No matter how much interested one may be in some athletic specialty, and also granting that much special practice in that specialty is necessary, it should never be forgotten that the greatest possible all-around strength will be of advantage. There are some games which tend to test and to show the qualities which one may have rather than to develop them. In the running broad jump, for instance, the great essential is speed, and the training for this event

should be confined chiefly to practice in sprinting, with practice in the actual jumping only twice a week. And in boxing, stamina and endurance, as well as strength, are to be gained very largely by distance running, special gymnastic exercises and other activities, as well as by the actual practice in boxing itself. Therefore, in all sports, one should aim first to gain a perfect degree of strength and symmetry through all-around physical culture methods. The question of diet in training is discussed under the heading of *Diet in Athletics*.

An important factor of successful training lies in knowing how to limit one's exertions. The ambitious youth, eager to achieve, is prone to carry his endeavors to the limit of his strength each day, and this is a grave mistake. Over-training is one of the most common of all faults in athletics, and while its consequences are not serious, and are readily dispelled by a period of rest, yet it does detract from the pleasure of the game and prevents one from doing himself justice in competition. It is important for the novice to keep in mind the fact that it is his purpose to increase his strength and vitality from day to day, gradually, so that when he reaches the time when he expects to compete he will then be capable of his very greatest achievement, instead of trying to see what is the limit of his powers each day in training. I have seen young men training for the 440-yard run, get out and run a quarter mile every day as though they were in a race, finishing exhausted. They naturally improved as long as their vitality could stand the strain, and then came the slump which was inevitable. They went "stale." If they had done only a fraction of the work, sprinting shorter distances, and taking easy jogs for longer distances, they would have gradually gained both speed and endurance, until some day they would have surprised themselves at the way in which they could run the race. While training they should not attempt to do their utmost speed for the full distance they are aiming at more than once every week or two.

There is a minimum amount of training that one can do without actually failing to develop the requisite strength.

There is also a maximum amount of work, beyond which one's vitality cannot respond to the demands made upon it, and beyond which one cannot avoid going stale. It is essential that one keep between these two limits. These limits will naturally vary with different individuals, and one should naturally understand his own temperament well before he can decide the matter for himself. It may be said generally that big men with a heavy muscular development, and perhaps a phlegmatic temperament, can usually stand a tremendous amount of work in training, indeed, require that much to get in the right condition. Lighter men, however, particularly those of the so-called nervous temperament, can get into condition quickly and need to be very careful to avoid too great a consumption of their energies. Some featherweight boxers can get in good condition in two or three weeks, and sprinters of a similar weight sometimes require scarcely more than a month of special training, always provided, of course, that they are in good health and fair general condition when they begin.

The athlete in training should not "run himself out" or "work himself out" more than a couple of times a month, if even that often. He should use his muscles just enough to build strength, instead of wasting it every day. This matter of conserving one's energy is not understood except by experienced athletes. For sprinting, there should be the hardest, concentrated work, but only a little of it every day. For a ten-mile run, it is necessary to prepare the system for a heavy demand upon its energies, and harder, more continued work is necessary, but it should not be carried too far *every* day. *Only occasionally* should the heavy demand be made, always allowing time for perfect recuperation. Just here is the whole secret—perfect recuperation—and one should keep within his powers to recuperate.

At the least indication of going backward, the athlete should rest completely for two or three days. This will bring him around better than ever. But if he notices it too late, and suffers a general physical and nervous depression then

he will have to drop training entirely for a couple of weeks or even more. He should make it a point to get all the sleep he can, taking an extra allowance on Sunday afternoon, if possible. He should eat lightly until his appetite returns in full vigor, and then he can resume training. And he will know that in the future he will have to gauge his efforts more moderately. But if he attempts to continue training in spite of his condition, he will only go from bad to worse. In short, one can largely follow his instincts in the matter, training just so long as he finds it a joy, and avoiding it whenever the protests of his overworked system make it a tedious effort, or in the vernacular, "too much like work."

In the splendid article on boxing which Mr. Fred Welsh has contributed to this Encyclopedia, he has included a brief training régime which should be of great value to athletes generally and to boxers in particular. It illustrates splendidly the relation of other exercises to the necessities of training for this particular exercise, though it should be said that the amount of exercise which Mr. Welsh is able to take in training might prove to be too much to some one else of less vitality and endurance, or at least so during the first year of his participation in athletics. It is sometimes surprising how little work is necessary to get good results in those games which depend upon speed rather than upon endurance. In the discussion of sprinting, under *Track and Field Athletics*, a brief outline of a weekly plan of training is given, which illustrates this point.

ARCHERY.—Archery is a pleasant outdoor pastime suitable for practice on the lawn. From an athletic standpoint it has no very great value, and depends for its interest largely upon the cultivation of skill. In this respect it is of course far superior to rifle shooting as an exercise, though the arms and shoulders only are concerned. It is naturally a survival of the activities of primitive life, and much of its interest is due to this fact, the same as the pleasure which many men find in fishing and hunting.

BASEBALL.—Baseball is the most popular of all sports in America, and is played in every city, town and hamlet in the land. It is a clean game, for even the big professional leagues are free from corruption. It is a game that men love as much as boys, and for the sake of the game itself, not because it offers a betting possibility, as in some varieties of so-called sport.

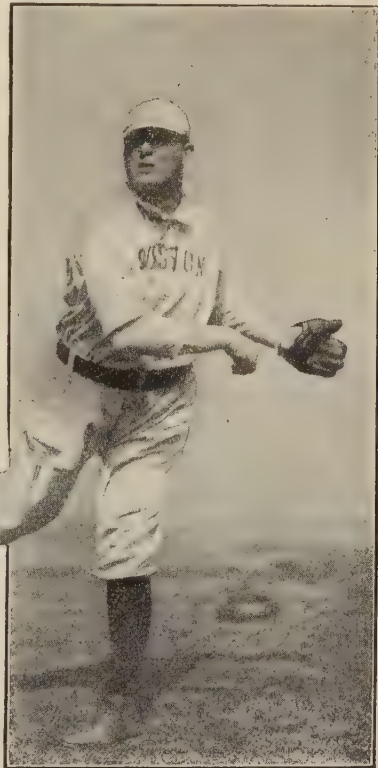
Although the action of the game is not so continuous as in many other vigorous pastimes, yet speed is an essential when the batter hits the ball and gets the players into action. The physical demands of baseball are not so severe as in many other games, although the pitcher often undergoes a strain upon the muscles of the arm that leaves him unfit for play for some time to come. Baseball is a game that carries with it a keen mental interest, and it is largely this that accounts for its popularity. The base running is naturally splendid exercise, while throwing, catching and batting are splendid for muscular co-ordination, but there are many other games that are better for purposes of exercise and development. In baseball there is always the larger part of one team that is unemployed, waiting for the opportunity to bat, while at the same time a part of the team in the field has nothing to do except to wait for something to happen. Where the pitching is poor and the batting good, there is naturally plenty of action. In a really good game, however, in which the pitcher is successful, it must be said that the interest of the game is far greater than its value as a form of exercise. It is perhaps better for demonstrating or making use of great physical fitness and efficiency than for developing the muscular system and building strength. The fact that it gets more people out-of-doors than any other American sport, however, makes it our greatest and most valued recreation.

Because of the lack of any special physical demands upon the player, the average youth takes up baseball without any special training whatever. Certainly he does not undergo the rigid and faithful preparation of training that is necessary for the boxer to condition himself. However, since strength and co-ordination of mind and muscle are such important factors

for success in baseball, it would more than pay those who expect to take up the sport to go through a course of special training throughout the winter to acquire the greatest possible physical fitness. The complaint commonly known as "Charley-horse," merely a soreness and stiffness of the joints and muscles, which is very commonly experienced by so many ball players in the spring of the year, might be avoided entirely by such a course of preparatory training. Speed in base running should demand a large amount of special practice in sprinting, away from the diamond, and at other times of the year, but there are few young men interested in baseball who think of such a thing.

Throwing and catching are of course largely a matter of practice, though it may be said here that one should never take up pitching and the throwing of curves, no matter how gifted he may seem in that direction, without spending one or two years in acquiring a powerful development of the throwing arm. Throwing curves is a tremendous strain, not only upon the muscles but also upon the ligaments and tendons of the arm, and it is advisable to have an arm of great power to stand this strain.

Good batting is of course one great essential of the successful ball player, and good batting is really a matter of being able to get one's eye on the ball, judging it properly. To acquire this ability one should have a great deal of bunting in practice. In learning to bat, one cannot train the eye as



"Cy" (Denton) Young, for twenty years a successful professional pitcher.

to the course of the ball if he is also trying to swing violently with the bat. After he has acquired the ability to find the ball every time with a bunt, then the aspiring batter may commence to hit it out, until he fulfills his ambition to send it over the farther fence.

A great deal of interest is taken in the games of the various teams of the big leagues, and the money represented in baseball runs up into tremendous fortunes. For purposes of health and physical benefit, however, it is infinitely better to play in a little game of ball than to watch a big one, and this is the suggestion which I would make to all readers. Even though one plays the game badly, yet he will at least have the exercise and the fresh air. He may get the air, to a certain extent while sitting on the bleachers watching the experts, but if he throws and bats the ball, and runs the bases a dozen times, the full deep breathing induced by this exercise will cause him to get a hundred times as much of the oxygen of the fresh, pure air, as he would while sitting still among a crowd of fellow fans. "Rooting" or shouting at a ball game may use one's lungs a bit, but it is not like the full inspiration that goes with vigorous exercise.

BASKET BALL.—There are few indoor sports which so favorably affect the various parts of the body as does basket ball.

In 1898 Professor Naismith, later of the University of Kansas, but at that time an instructor at Springfield Training School, invented the game as a sort of gymnasium exercise for the students, and very little thought was given to it. To-day the game is played all over the country, and is one of the leading sports at many of the great colleges.

Unlike many of the other sports, basket ball does not tend to develop any particular part of the body, but acts as a general up-builder. The arms are exercised by throwing the ball, and passing from team-mate to team-mate; the legs are developed by their continuous action in running up and down the court, and the condition of the chest and lungs is improved by the active work required of them and the free deep breathing induced by the game.

A large part of the game, in fact, the success of a team, depends upon the brainy work of the players, who should take advantage of every opportunity presented to cage the ball. In this manner the game offers a certain degree of mental training, as does boxing and many other sports.

Accuracy is one of the requisites of a player, and the eyes receive good training in the basket shooting practice. Many a man sound in mind and body, but with poor eyesight, has been benefited to a great extent by this practice.

The game is played by ten men, five on each side, and the time of play is divided into two periods of twenty minutes each, with a rest of fifteen minutes between both halves. During the twenty minutes' play in both halves, the players are allowed but three rests of five minutes each, if necessary, so that they are practically on the go all of the time.

Two baskets and a ball make up the paraphernalia of the game. The ball is a little larger than a soccer football, and weighs more. The idea is to cage the ball in the baskets, which are suspended from the ceiling or are placed on stands.

For the gymnasium, there is no better game. At the same time, when played in the gymnasium, there is the disadvantage of the fact that it is played indoors, and for this reason the open-air basket ball courts should be encouraged as much as possible. Open-air playgrounds in our cities sometimes have



Photograph by Keystone View Co.

Showing a splendid open-air basket ball court. The game is at its best when played outdoors.

arrangements for basket ball, the "baskets" fastened to posts instead of to the walls as is common in most gymnasiums. One may enjoy it as much in the gymnasium, and may develop nearly as much endurance and speed, but the constitutional benefits are much greater when played out-of-doors. While considered a winter game, from the fact that it is usually played under a roof, there is no reason why it should not become equally popular as a summer game when played out-of-doors.

BATHING.—See *Swimming*.

BICYCLING.—See *Cycling*.

BOATING.—See *Canoeing*, *Ice-Boating*, *Rowing* and *Yachting*.

BOWLING.—Bowling is a popular sport, because of its attractiveness to both beginners and experts. As an exercise it is fair, though one-sided from the fact that one uses only the one arm with which he has become most expert. From the standpoint of exercise it would be far better to learn to use both arms equally well. It would sometimes add to the interest of the game for a couple of right-handed players to match each other in a game with only the left hands used. Bowling is fairly good for the back.

Occasionally an enthusiast of means constructs an open-air bowling alley, though sheltered from the rains by a roof, on the grounds of his country home, and under such circumstances the game is to be recommended. Unfortunately, however, it is usually played in cities in public places, in low-ceilinged, unventilated quarters, adjacent to a bar-room and in an atmosphere dense with tobacco smoke. While presumably seeking the exercise, the youth learns the habit of alcoholic indulgence, and if he has not already fallen into the use of tobacco he is almost certain to take it up in such surroundings. Even if he does not smoke, he must endure, at second hand, the smoke of others. For these reasons it would be just as well if bowling were neglected and forgotten, unless a more enlightened public sentiment should lead to bowling in the open air. The old game of *bowling on the green* was well worth while.

BOXING.—[I am indebted to the courtesy of Mr. Fred Welsh for the following contribution on the subject of boxing, written especially for this Encyclopedia. Mr. Welsh was perhaps the world's most skillful boxer in his day, and he also knew how to make his methods clear to others, making these instructions of exceptional value. Much of what he has written here has never before appeared in any article or book on boxing. Fred Welsh (Fred Hall Thomas) was born in Pontypridd, Wales, in 1886. He was an instructor in the Macfadden Physical Culture Training School when it was first organized, and later took up professional boxing, meeting with success from the very first. During the first five years of Mr. Welsh's career as a professional boxer, he suffered only two adverse decisions, out of nearly one hundred contests. In 1909 he won the Lightweight Championship of Great Britain. In July, 1919, he gained the World's Championship and retained that title until his retirement from the ring nearly three years later. He is a vegetarian and a thorough physical culturist from the standpoint of the various methods and practices advocated in this work. For the photographs illustrating this article, we are indebted to poses by Mr. Welsh and Boyo Driscoll, a clever and successful featherweight boxer, of England.—THE EDITOR.]

MODERN SCIENTIFIC BOXING.

By Fred Welsh.

Boxing is a most valuable exercise, not only for building strength and endurance, but for developing all of those qualities which go together in the making of splendid, virile manhood. It trains not only the body but the spirit as well, develops courage, moral and physical stamina and teaches rigid self-control in all emergencies.

The boxing game dates back to the beginning of history, though it has not always been the delightful and beneficial sport that it is now, in its modern refined interpretation. Among the ancients a boxing match was sometimes not much less serious than other gladiatorial combats in which the sword was used. In place of the padded mitts of our own time, com-

monly called boxing "gloves," the cestus was used. The hands were covered by strong leather thongs, and sometimes these were reinforced with bands of iron, the fist of the boxer being made so formidable in this way that a well placed blow might mean death. In any case the result was a terrible mutilation and permanent disfigurement.

Modern boxing, however, takes on the character of exercise rather than of real fighting, for it is seldom that a boxer who is sufficiently well trained is truly injured. If boxers are fairly well matched in speed and skill, then in many cases the outcome of the contest will depend chiefly upon their stamina and endurance. Boxing is now a "sport" in the true sense of the word; it is the "play" form of fighting, and while it prepares one for competent self-defense in time of emergency, it also makes him stronger and more vital. It trains the eye, makes one more alert, gives him more confidence, develops decision, perseverance and firmness. In short, it is a splendid exercise for both the moral and physical education of any young man, developing the qualities which he will need throughout life for attaining success in almost any field of endeavor.

Naturally, I have no sympathy with those who talk of the supposed brutality of the boxing game, for they probably have in mind the old time "prize-fighting" days when bare fists were used and the pugilist could do almost anything he chose to his antagonist. Boxing to-day is entirely different, for there is a strict set of rules which permit of hitting only in certain parts of the body where the blows are not vital, and there is a referee in the ring to see that the contestants abide by these rules or be disqualified. Well-padded gloves are worn on the hands, and matchmakers and promoters everywhere endeavor to match boxers who weigh the very same to a pound, so that they will be evenly matched. Before the contest both boxers are compelled to "weigh in" to see that these conditions are fulfilled. They go through a preparation of training which necessitates strict clean living and faithful exercise, putting them in the ring in a splendid physical condition to go through

a trying contest, trying chiefly from the standpoint of endurance. It should be said that after boxing at terrific speed for some time the inevitable fatigue of the muscles takes the sting from the blows so that in a twenty-round contest one does not hurt the other very much. Even in the beginning of the contest, both are so well trained and hardened that they do not suffer from the blows delivered with these pillowed gloves.

One of the first qualifications of the modern boxer is intelligence. The day of the old-time bruiser who required nothing but brute strength is passed and dead. There is money in the boxing game to-day as well as glory. It has been brought down to a commercial basis, and so has attracted young men of intelligence and brains the same as other professions. One must be clever, alert, quick thinking.

But apart from the intelligent, quick thinking mind, the physical essentials of the boxer are *strength, speed, stamina* and *endurance*. First of all one should build strength, which later will help in developing endurance and stamina, but while securing strength one should be careful not to become muscle-bound or stiff, or his strength will be of no use. One should exercise in such a manner as to keep his muscles elastic and supple and to develop speed. After this will come the knowledge and skill in boxing.

Perhaps an even more important factor in some cases is learning *how to nurse your strength*. And the secret of this is *relaxation*. One should make this a fine point. Often a boxer who is not nearly as strong as his opponent may so conserve and employ his strength that he will seem far stronger, allowing the other to waste much of his great energy. The secret is complete relaxation except when actually doing something. There is no need for tenseness of the muscles when fiddling and sparring for an opening. If one's muscles are so tensed he cannot possibly strike quickly when the opportunity comes, for he must first relax and then contract the striking muscles. If relaxed, the muscles may contract with great vigor at the moment of impact, but the instant the blow has been struck, they should be relaxed again until the next blow. I also

nurse my strength in another way. While relaxing as much as possible on my own account, I try to keep the other fellow tied up with muscles tense in expectation of my attack, which brings him to a condition of fatigue all the sooner. This I accomplish by constantly feinting and changing my position by shifting my feet, so that he is parrying or blocking blows that never come, and sometimes making and missing wild swings that tire him out.

In another way it is well to let the other man use his own strength against himself, and by these tactics I have often been able to get the better of big fellows of apparently twice my strength. If I can get the other man pushing against me, to show me how strong he is, I will resist him a little for a moment and then, suddenly discontinue my resistance. As a result he goes plunging or sprawling forward, and surprised at the strength with which I appear to throw him around. I may also use his own strength to make my blows more powerful. I feint to make him lead, and when he is rushing toward me my blow has nearly double force. Meanwhile I am always relaxed except when actually executing some effective move. I have been credited with wonderful endurance, but while my endurance is better than most athletes, a great deal of this is due to making use of the other man's strength to my own advantage and also to this practice of relaxation. In many cases I have boxed the last few rounds of a twenty- or twenty-five-round contest faster and stronger than the first few rounds, simply through nursing my strength. During clinches and "in-fighting" it is quite common for boxers to push and wrestle each other with all their strength, but I never do this. I find it more easy to simply lean against my opponent with my relaxed weight, although he may think I am pushing, and in this way I sometimes induce him to hold me up or sustain much of my weight.

Now for the actual boxing itself. I do not believe in strictly orthodox styles, but would suggest that to a large extent each individual develop his own natural style. But there are certain radical errors which should be avoided and

certain fundamental "first principles" that one should learn. The most important thing is the general position, and this some amateurs never get right, to their disadvantage. Get this right, and they may then drift into their own styles and peculiarities.

The left foot and the left hand should be forward. The left toe should point straight at your opponent, and not be turned to the right a little, as it may if one is careless. The left leads are likely to go where the toe points, and if this is not directly toward the other man these leads are likely to miss. The body should be turned with the left side toward antagonist, showing as little front or body surface as possible. Thus there is not so much space exposed to attack. The left knee should be bent slightly, the weight chiefly upon the right leg. The left elbow should be bent, the glove on a level with the shoulder, and ready to be extended quickly for a lead. Both elbows must be well in at the sides, for it is chiefly upon them that one should depend to block body blows.

The right arm should be carried across the body, the elbow close to the right side, the forearm across the solar plexus, called the "mark," and the glove up by the chin. Many blows may be stopped here by the open right palm in front of the chin or with the half closed glove resting on the chest and near the chin. The head should be held well forward, the chin down and inward, almost resting on the chest, and sheltered by the left shoulder from any wild right swings from opponent. The attitude of the whole body should be loose and relaxed.

I will invite the reader to a careful study of the illustrations, showing some of the important positions and movements. I do not expect these instructions to teach all there is to be taught about boxing, but if they will enable one to grasp the "first principles," they will enable anyone to acquit himself splendidly in a very short period of practice. By following these suggestions, one may develop a splendid defense, and as a result of this will be able to enjoy his boxing much more right from the start. The pleasure of the game lies much in the skill and science, not in getting hit.

(Continued on page 873)



PHOTO NO. 1

General boxing position, ready for either attack or defense. Left knee slightly bent, toe pointed toward opponent, left hand extended with glove on level with left shoulder, right forearm across chest, chin down under protection of left shoulder, and body turned sidewise toward antagonist. Read carefully discussion of position in accompanying text. In attacking, the crouching attitude shown in Photo No. 7 is advantageous, affording a good defense while advancing.



PHOTO NO. 2.

Drawing back from a left lead or right swing, and ready to block the blow with the right palm if necessary. The drawing back will often be sufficient to escape the blow, but sometimes it is necessary to step back at the same time with the right foot. The force of the blow will be minimized in this way, even if it lands. Blocking blows to the face with the open palm is a very effective method and should be practiced. Meanwhile the left is ready for a hook or swing to the body or jaw.

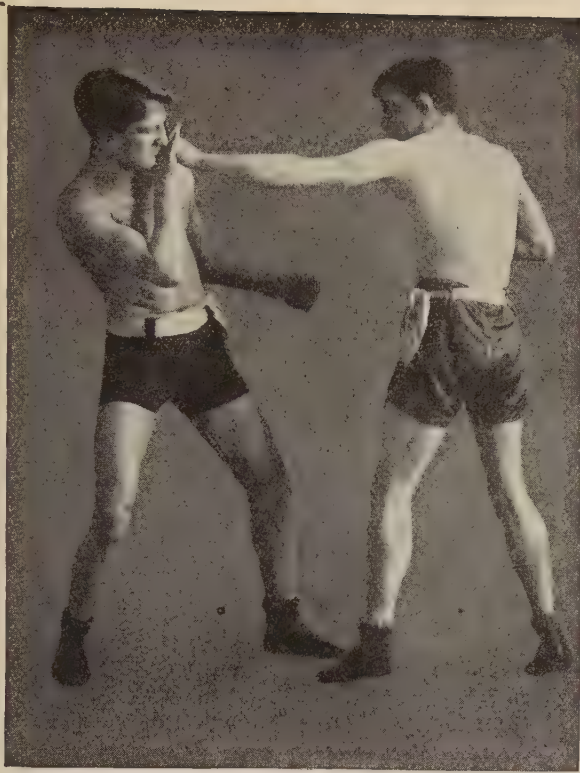


PHOTO NO. 3.

Showing the straight left lead and also the operation of the method of blocking shown in the preceding illustration. Welsh (on the left) steps back slightly with the right foot, taking away any force in the blow, which is effectually blocked with the right palm. In executing the left lead, do not draw back the elbow first, but simply shoot the arm quickly and forcibly from the position shown in Photo No. 1, at the same time stepping forward a few inches with the left foot and throwing the weight of the body with the blow. The glove (lightly closed), must land on the opponent's face the identical moment that the left foot touches the floor, otherwise most of the force of the straight left lead is lost.

PHOTO NO. 4.

The most effective of all defensive positions. When opponent is raining a fusillade of blows upon you, this is a safe position to get into, but it also has the advantage that you are in a position to hit at the same time. It embodies the idea of the crouch, the chin drawn down near the chest, and protected from swings by the shoulders. The elbows are in a position to block all blows to the body, while hooks, swings or leads to the face are blocked by the wrists and gloves. If one is tired, this protection will enable him to weather it until his strength recuperates. To guard against left or right uppercuts while in this position, bring the elbows close together. Uppercuts aimed at the body will then be blocked by the elbows, and uppercuts aimed at the face will be blocked by the gloves, wrists, or forearms.

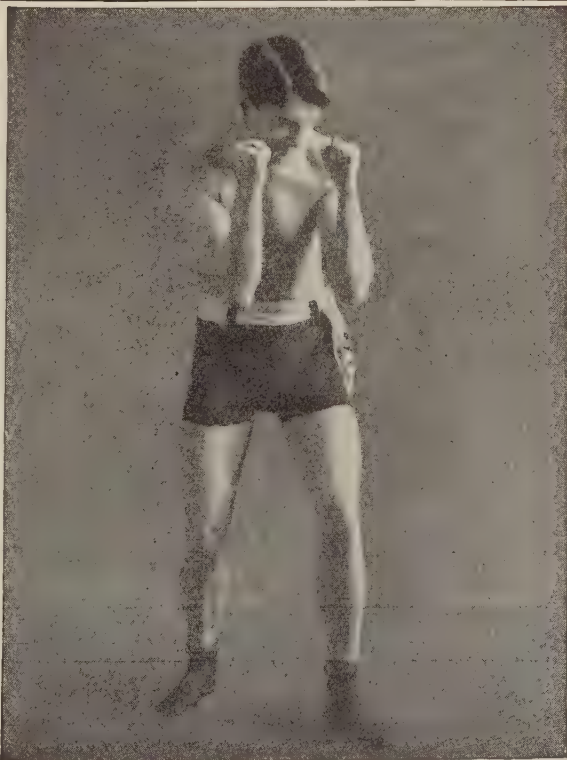


PHOTO NO. 5.

Showing the working out of the position posed in the preceding photograph. Having blocked right and left swings to the face, and being "inside" the other's guard, a quick left chop to the jaw is a simple matter. It will be seen that the right also is ready for a similar quick chop to the jaw. This can be worked when stopping all swings to the face with the wrist, either right or left.



PHOTO NO. 6.

Another illustration of the effectiveness of the defensive position shown in Photo No. 4, as a means of readiness for attack. This shows how a left swing to the body has been blocked by the elbow, a right swing to the face on the other side being avoided by receiving it on the left wrist, countering with right and left hooks to the jaw. This shows the advantage of short arm blows over wide swings. They are two or three times as quick, having a shorter distance to travel, and one is able to start them from the position in Photo No. 6, without having to waste time drawing them back before hooking them to the jaw.

PHOTO NO. 7.

Showing a "crouch," a good position for getting inside of opponent's guard, and especially if he is one of the wide-open, swinging type of boxers. The chin is well protected behind the left shoulder, so that a right swing for the jaw is stopped by the shoulder. In this crouch you are not only in a position to defend yourself but to start almost any kind of a blow, jab, hook, uppercut or left and right body drives.

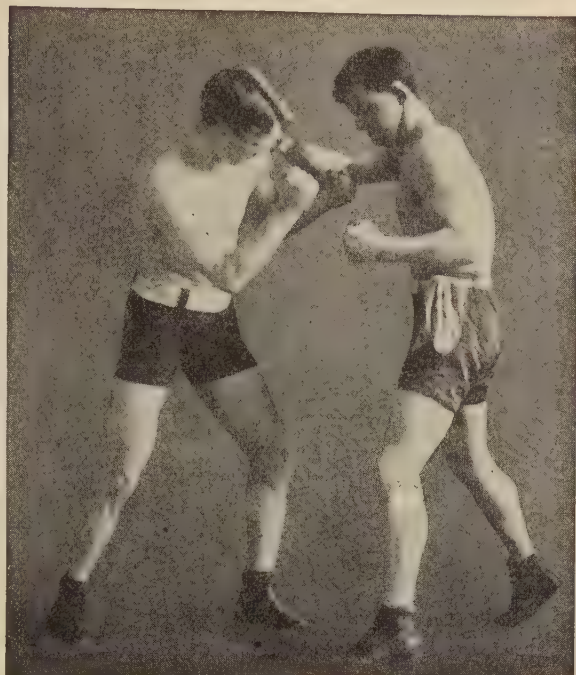


PHOTO NO. 8.

This shows opponent blocking a right hook to the body with the elbows, and countering with a right to the body. The elbows should never be spread out at the sides like a pair of wings, as is the habit of some amateur boxers, for this leaves the body exposed. The elbows should be kept well in, but not so close to the body that the jar of blocking with the elbows will hurt. By constant practice some boxers are able to contract their arm muscles just at the right moment and block terrific blows with their elbows or wrists about an inch away from the body or jaw. If handled properly, they will enable you to stop practically all body blows in this manner.

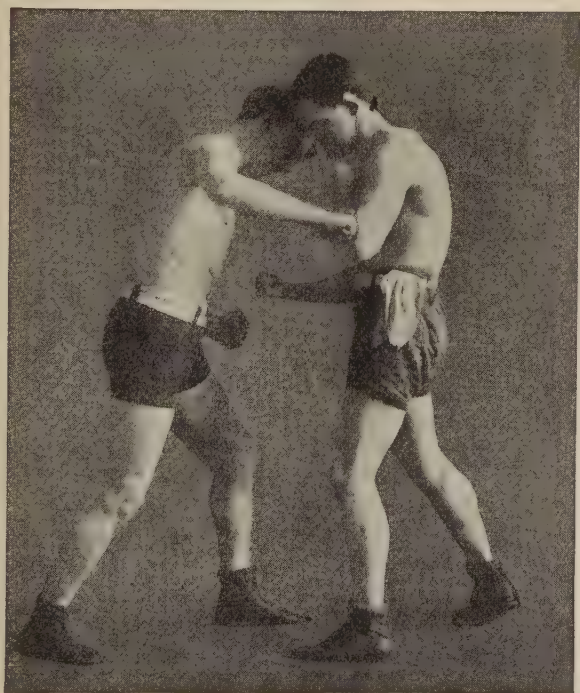


PHOTO NO. 9.

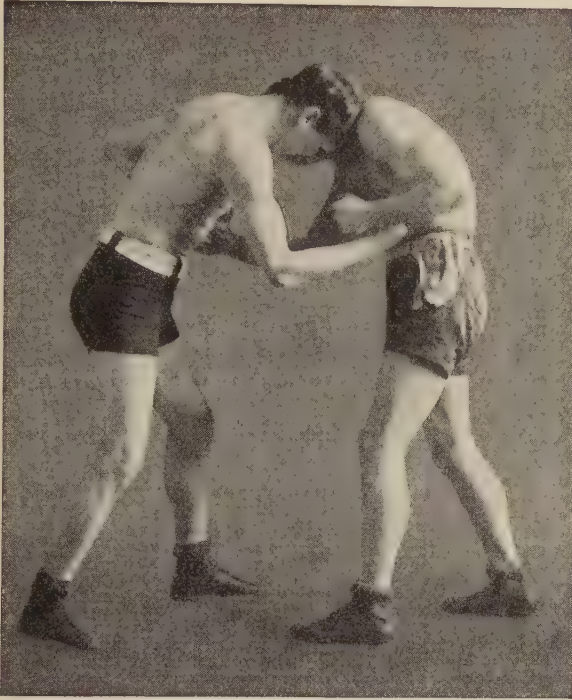
"Side-stepping," one of the most effective of all defensive boxing manoeuvres. This requires only a quick little step to one side or the other. It is necessary to move the head only a few inches, or just sufficient to avoid the lead that is coming, whereupon it will go over the shoulder, as in this case. To make a wide step would be a waste of energy, and take you out of position for attacking. To turn around and run away is very bad boxing form. It is always better to side-step and counter. This photograph shows a left hook to the chin, having side-stepped a straight left lead, with the right ready for a drive to the body.



PHOTO NO. 10.

"Slipping" the head, and countering with left hook to chin. This "slipping" of the head should be practiced until thoroughly mastered, as a means of avoiding leads and right swings. It will be noticed that from the usual position the head has been turned toward the right shoulder. In doing this, the head should be kept well forward and down, the chin moving along across the chest, or touching the chest as it moves across.

PHOTO NO. 11.



An example of what is known as "in-fighting." After sparring at long range the boxers have come close together, with heads on each other's shoulders, exchanging left and right drives to the body. In the position of in-fighting especially it is important to keep the elbows in as a protection against body blows, whereas the fore-arms and wrists may be used effectively in blocking uppercuts to the face. Often after such an exchange of drives to the body it is well to switch over and shoot in a couple of jolting uppercuts from this position. It will be noticed that this is a legitimate form of boxing, since it is not a clinch, for there is no "holding." Neither boxer is allowed to seize and hold the other's arms. If he does so, he must "break" loose at the command from the referee.

(Continued from page 867)

There are some teachers of boxing who regard defense as of first importance. There are others who regard attack as the most vital and important element, while some repeat the old platitudinous paradox that "the best defense is offense." I would take sides with neither, inasmuch as both defense and attack are necessary factors of good boxing, and the ideal style is one that aims to combine the best possibilities of both. By following closely all of the brief instructions given here, the pupil may develop a defense that is almost impregnable, but one which does not interfere with his readiness for attack, as he will find. By these methods he may be aggressive without sacrificing the security of his defense.

The lower jaw especially should be protected. The chin is called the "point," and knock-outs are scored chiefly on the "point" of the chin and the solar plexus (the "mark"). Never having been knocked out, I am unable to describe the experience or its sensations, but I am told that a blow close to the solar plexus gives one a nervous shock, and is the most

unpleasant blow in boxing. A blow on the point of the chin does not hurt but it dazes, and is therefore a common object of attack.

Having acquired the proper position, one should take up one by one and practice thoroughly the various important blows, parries and moves of boxing, before trying to put them into use in a real boxing bout. Boxing wildly without method or knowledge leads to bad habits which are hard to correct. It is better to take a beginner who has never seen a boxing glove, and then to start him out right, than to correct the confirmed mistakes of one who has done much incorrect boxing. Get a friend who is equally interested and practice leads, hooks, swings, with parries, blocks and counters, side steps and everything else, getting them down fine before boxing in earnest.

The left hand should be held out on a level with the shoulder, as I have said, and in front of opponent's face, so that you can snap it out quickly for a *left lead*, which is the most important blow in all boxing tactics. There are many who naturally take to the wide swinging style, seeking to gain power in these swings, but just here let me advise the novice to train himself in the straight leads and short arm blows, jolts and hooks. The swing is the easiest thing in the world to block or avoid, and if you see your opponent coming for you with these swings, just remember that a straight line is the shortest distance between two points, as a principle of physics, and that you can beat him to it by straight jabs.

Alternate with your friend in practicing the left lead and method of blocking it, as shown in Photo. No. 3. In leading, turn the hand slightly so that the blow lands with the palm down. Other times the straight left can be delivered with hand held so that thumb is uppermost when the glove lands on the face. Throw the weight of the body forward with the blow, vigorously, and step forward a few inches simultaneously with the left foot. Step in with the blow, and not before or after. Sometimes the left lead is used without stepping in with the left foot. In that case it is just snapped out into your opponent's

face. It is often used as a counter in this way, and if your opponent is jumping in at you a straight stab on the nose has a lot of sting to it, besides preventing your opponent landing a blow on you. After one lead, step forward immediately with another lead, and then another. Follow up with a series of straight left leads if you see they are landing properly, all the time looking for an opening to shoot over a right punch. Incidentally this will give good practice in foot work, for this is similar to the principle of advance and retreat in fencing, and of the greatest importance. In fencing the right foot is first, followed by the left foot, but in boxing, of course, it is just the reverse (left foot forward followed by the right). In advancing, the forward foot moves first, with the blow, if one strikes, and the other foot follows after. In retreating, the rear foot moves first, stepping back a few inches or as far as need be, and the front foot follows after. In the series of left leads to be practiced as just described, the retreating movements of the other man should be simultaneous with the advances of the man making the attack. As will be seen from the photograph, the left lead is blocked by the palm of the right hand, and also by stepping back to minimize the force of the impact; the forward foot following immediately by stepping backward the same distance. With the next lead the retreating movement is repeated. The same general scheme of foot work should be practiced in connection with all of the other blows, advancing and retreating, and also learning to move around in a circle as in a ring, both when advancing and retreating.

Great care should be taken not to get both feet together. They should always be about eighteen inches apart, according to height of boxer. A tall man would probably require his feet more than eighteen inches apart, while a short boxer may have a better grip on the floor with his feet about twelve inches apart. It is just a matter of feeling secure and safe on one's feet. If the feet are too close together a blow will easily knock one down like a nine-pin. I try to grip the floor with my feet just as an expert rider grips a horse with his knees. On the other hand, if the feet are spread too far apart a

boxer is unable to move about quickly enough to get away from the attack of his opponent.

By practicing "following" an opponent and retreating, as explained, a boxer will soon be able to do circular foot-work. This is more difficult than the ordinary forward and backward movement, but if the feet are never brought closer than twelve inches together, and a great deal of practice is indulged in, the novice will soon find that he can jump in to attack or retreat from the most difficult positions.

After some practice with the left lead the man on defensive should practice countering with his left, man attacking blocking this also as he leads. The same use of the open palm is effective in blocking a right cross or swing, and left and right blows should be practiced the same as the left lead, the right foot moving toward opponent simultaneously with the right hand blow, the other retreating accordingly. This is a very effective series of blows. It is usually known among the initiated as the "one-two punch." Similarly the student should practice hooks, swings and uppercuts with both hands, side-stepping and other foot work. He should particularly note the "crouch" shown in Photograph No. 7, with its description, the side-stepping and "slipping" of the head shown in Photos Nos. 9 and 10. The weight of the body should go with all blows. In hooks and swings this means the swing of the shoulder along with the arms. Uppercuts should seem to rise with the full force or momentum of the entire body, from the toes up.

Good boxing depends much upon its strategic aspect, and one should make a study of this. In giving suggestions for feinting I can probably make myself most clear by telling simply the methods which I use. I not only feint with my hands, but also with my eyes and with my feet. Feinting with the hands is very simple, for a quick little movement may look like a blow starting on its way. I may feint for the body with the left, dropping it a couple of inches quickly, and then shoot over the right to the face, or perhaps draw back the right as though to hit hard and then put in a quick left jab. Or

pretend to hook the left high on the face which often has the effect of making opponent put his guard higher up, thus leaving his body exposed. Quick as a flash one may whip over a left hook or drive to his body. The same applies when you feint at the body; the opponent lowers his guard, exposing his face to attack, then you may rain a hurricane of blows on and around his jaw. Remember that there is nothing so quick as a left lead, and if one does it quickly he can sometimes get it over even when the other is on his guard, expecting such things to happen. It should be like lightning. One or two feints or false moves followed by a lightning and vigorous left jab will often score.

Feinting with the eyes is often very effective. I usually keep my eyes on my opponent's eyes, but in feinting I suddenly drop them and look at his stomach. The first once or twice that I do this I actually do hit him in the stomach, so that he comes to expect this. The next time, I suddenly look down at his stomach and he puts both his arms down there for protection, whereupon, still looking at his stomach, I whip one over to his face like a flash, often a one-two attack with both left and right.

Much can also be done with the feet. Sometimes I step forward, pretending to attack, and then draw back, which leads him to lunge. If he leads hard, any blow which I might deliver at this moment would have double effect because he is coming to meet it. A feint at side-stepping, a little to the right, for instance, will lead opponent to think that I am shifting my base of attack in that direction, and he will move over to face me. Instead of this, however, I quickly step far to the left, and attack him to great advantage from this position, to one side of him. One may work all possible variations of this.

I often mislead an opponent by placing my left hand on one of his shoulders, or sometimes upon his forehead, and pressing against him. Invariably he resists this pressure, pushing as hard as he can against it, perhaps to convince me of his strength. This is just what I want, for not only is he

then partly off his guard, but when I quickly release the pressure and strike with my right, he plunges with full force into the blow. This little stunt nearly always works. It is the same with pulling, for if I cannot get my hand on his shoulder or head, sometimes I hook my left wrist in his and start to pull. Immediately he forgets about boxing and commences to pull hard against me, so that while his left arm is locked in pulling against mine, I can usually shoot a right uppercut under it to the body or a cordial and well meant right hook over it to the face.

Remember that a boxing contest is made up of both aggressiveness and defense. It is not merely a question of self-defense. Aggressiveness wins more boxing contests than anything else. The man who lacks confidence will be hopelessly handicapped. The plan of continually advancing upon your antagonist will be found among the very best of all boxing tactics, and if your knowledge of boxing is what it should be, and you have mastered the few "first principles," which I am here trying to make clear, you may be aggressive and protect yourself pretty well at the same time. This is the essence of good boxing. If you can attack successfully, and at the same time thwart the attacks of your opponent, you win. But always, be aggressive.

As for training methods, in preparation for a contest, it might be said that different individuals may require somewhat different methods, but there are some general principles which every one should adhere to. It should be the aim of the boxer to do such an amount of exercise every day in training that he will be sure of going through his contest without getting tired. Naturally, it will not take so much preparation for a six-round bout as for a long contest.

In my own training I first follow a diet of fruit and fruit juices, for a few days. I start my training very gradually for each contest, never jumping suddenly into hard training. After I have prepared myself for really hard training, however, by a week or more of gradually increased work, the following is my daily routine.

I start in the morning by twenty minutes of all-round exercises, floor movements, dumb-bells, elastic exerciser and devoting special attention to the abdominal and back muscles. I practice very faithfully some special exercises for developing a powerful back which were shown me by Bernarr Macfadden, and which I believe absolutely necessary for boxers and wrestlers, if they wish to reach the most perfect condition. I also develop great strength in the "washboard" muscles across the front of the stomach, which protect me against any heavy body blows that I might not succeed in blocking. I usually avoid such blows, but if they should land they do not have the same effect as in the case of a boxer with less development of these muscles.

Each morning also I practice deep breathing exercises, after which I put on my sweater and go out for my road work. I walk and run out into the country for three or four miles, adopting the plan of alternate runs and deep breathing exercises while walking. Walking, I take a set of twenty long deep breaths, and then run a distance of several blocks, take another set of twenty deep breaths, then another run, and continue so on until I have taken ten sets of breathing exercises, or some two hundred altogether, and ten such runs. By this time I have reached the distance of three or four miles out, after which I turn around and run all the way back to my quarters. Returning from this run, I have a cold bath followed by an hour's massage. Following this massage I have my first meal. After this comes a rest until about half-past four in the afternoon. To start my afternoon training I do a little more exercise.

I then punch the bag for twenty minutes, not attempting any fancy work, but practicing on the bag all of the various blows which I use in boxing, so that I may become accustomed to the continuous hitting without getting tired. After this comes twenty minutes of shadow boxing, in which I have a system of my own quite different from the method employed by many others. With some boxers shadow boxing is little more than the dancing about on the feet which one will practice

in the ring. As one might judge from its name, shadow boxing is supposed to mean sparring with an imaginary antagonist. In my own shadow boxing I take up separately each and every one of the various blows which I use, and practice it repeatedly, with the accompanying foot work, side-stepping and parrying.

After this I box eight, ten or twelve rounds with different sparring partners, mixing them up so that I may develop strength, endurance and speed. Perhaps first I will take on a big, strong, rough boxer who will tear into me and give me a lot of "rough house" work, for a few rounds, and then for the next few rounds I meet a clever, fast boxer. After the boxing I have a cold shower, a massage, and supper.

CANOEING.—To the uninitiated and the over-timid, the canoe is often regarded as the acme of all that is treacherous and foolhardy. To the careless or venturesomely inexperienced, so it is! But if the tyro will merely obey the injunction to attempt no "smart" tricks and use ordinary judgment, with careful following of certain fundamental principles, he will speedily learn to handle a canoe with a fair degree of expedition, comfort and practical safety. The canoe is as sensitive as a watch to conditions. If you use common sense,



Canoeing on a Maine lake.

paddle with a long, steady, regular stroke; do not attempt any eccentric stunts; never try the idiotic feat of changing canoes on the water; keep your wits about you and handle the craft as the North American Indian—the man who invented it—does, you can enjoy one of the most fascinating and health-giving of pastimes. There are perhaps none that supply finer exercise and more refreshing recreation for either sex.

One special benefit of learning to canoe is that it induces a desire to learn to swim.

The Indian will always remain the undisputed master of canoeing as a fine art. His methods should be followed by all who want to canoe in the best possible manner. The Indian does not sit so far down in the canoe as to strain his abdomen in paddling, nor does he perch himself too high and thus well nigh break his back. He merely curls himself into a compact, easy, comfortable pose, paddles with a long, steady but powerful stroke, and the speed with which he can send that frail bark over the water in an emergency is something truly wonderful.

In case of capsizing the Indian method of getting back into the craft and keeping it from shipping water is most ingenious. He grasps it firmly by the gunwale and gives a sudden but powerful jerk. The canoe will turn clear over. At the moment he jerks, he will give a peculiar spring and land astride the gunwale every time.

Good exercise is afforded in the use of either the single paddle or the double paddle, the latter being a long oar with a blade at each end so that one may alternately dip on each side of the boat without changing hands. The course of the canoe is not so direct and steady, however, as with the single paddle.

In using the single paddle the blade is rather inward and under the canoe instead of out to the side, as in ordinary rowing, which would turn the direction. To keep the course straight in spite of paddling on the one side, the beginning of the stroke should be slightly inward, finishing up with a slight

outward inclination. One should learn to paddle equally well on each side, not only for symmetrical development but also for the greater pleasure.

It may be remarked that after trials of many kinds of making, the canvas canoe has come to be regarded as undoubtedly the best. There is a sheathing of cedar and over this is drawn the canvas. This is treated with waterproofing and then painted in any color or design.

COASTING.—Coasting and tobogganing could be highly recommended for building and maintaining health if only on account of the wholesome pleasure and the outdoor air associated with such sport. The out-of-door life in winter is especially beneficial because the bracing cold has a powerful influence in building resistive vigor, and in making one hardy and warm blooded. But if the slide down the hill is calculated to set one's blood in active circulation through its joyous thrills, it is only the inducement for climbing the hill. And when one has climbed a long, steep hill dozens of times in an afternoon, not



The joys of coasting. A bob-sled starting the long slide.

laboriously and slowly, but eagerly and with no thought of fatigue, there's exercise for you. All that may be said of walking can be said for coasting, with considerably more besides. The alternating slide offers just the right amount of relaxation and recuperation between the climbs, so that one can keep it up for hours at a time, hours of incalculable profit both from the standpoint of pleasure and health. Normal, natural, wholesome pleasure, in its own self, has a biologic value that we know is great, though just how great is yet beyond our powers of computation.

Every child, therefore, should have a sled, and every family, if possible, a bob-sled. If it is good for the young, it is just as good for keeping Mamma and Papa young. It will make them better fathers and mothers, and the fellowship in sport of the parents will only add to the enjoyment of the youngsters.

CROQUET.—Croquet is a lawn game which for several decades enjoyed considerable popularity, though in recent years it has been somewhat neglected for the sake of more energetic pastimes. Long handled wooden mallets are used for driving large wooden balls through a series of wire arches set in the ground. The game is played on a small court and depends upon skill and delicacy of stroke rather than on strength.

It is an exercise suited to those who are frail or convalescing from some weakening disease. The best thing about it is that it takes one out-of-doors, but as an exercise for the healthy man or woman it is so mild as to be worth little. The arm exercise is almost nothing and while there is occasional bending and thereby a little exercise for the back, the chief exercise is that of moving about leisurely upon one's feet. From its mental interest it is an attractive game to many people, and may be recommended because it offers entertainment that will take one into the open air, and with little excitement. It would be a good game at any sanatorium.

CURLING.—The Scottish game of "curling" has so many devotees in this country that it may be properly included in our list of winter sports. It is a "fu' pawky sort o' pastime" that is usually indulged in by elderly or aged men having

full beards and wearing 'Tam o' Shanter bonnets and plaidies. Curling calls for smooth ice and a spot sheltered from the wind. Unexciting as the game may seem to outsiders, yet experts aver that it is full of moving chances and incidents that make it most interesting. In any event, the sweeping rush of the "stones" and the swish of the brooms are as music in the ears of the confirmed curler.

CYCLING.—The bicycle offers a truly valuable form of recreation and exercise, though it may be said that as an exerciser the wheel is not all that is to be desired. It is of value chiefly as a means of pleasurable outing, frequent trips far into the country for the sake of the sunshine and the air, being a matter of easy convenience. On this account I would highly recommend the bicycle.

As a form of exercise walking is much superior to cycling, though one may say for the latter that it will quickly take one distances and to places which would be impossible by the more modest paces of the walk. I would advise, therefore, that one do not attempt racing on the wheel, and not to try to depend upon it for bodily development, thereby perhaps losing much of its advantage as a means of true out-of-door pleasure. The bicycle develops a limited number of muscles,



The wheel brings its riders into close touch with Nature.

of the hips and legs, while neglecting others, and the general position of the body required for racing or very fast riding is unfavorable. The "hump" of the bicycle racer's back is a familiar object, and should be a warning object lesson. The low handle-bars and the bent position of the body necessary in racing for avoiding too much atmospheric resistance have the effect of cramping the chest and interfering with the internal vital organs. It is an unnatural position and should be avoided. In riding for health, therefore, one should be content with mild exertion and a moderate speed, enjoying the scenery, the sunshine and other things which make bicycle trips worth while. The handle-bars should be high and the seat adjusted so that one may sit erect, enjoying absolute comfort even though remaining on the wheel for hours.

Used in this way, the bicycle may be of great value. Otherwise it might better be left alone.

DISCUS THROWING.—See *Weight Throwing*.

EQUESTRIANISM.—See *Horseback Riding*.

FENCING.—Sword-play of various kinds has been practiced since the very earliest ages, and as its outgrowth we have our modern fencing. The fact that fencing still holds its place in the field of sport is enough to show of how great interest the art is, when so very many other means of exercise are now being practiced.

After the Greeks and Romans introduced sword-play, the people of Spain, Italy, France, and later Germany, England and America became enthusiasts and ardent students of fencing.

In olden times much heavier weapons were used, but these have given way to a finer, more tapering blade. After the rapier had been used for some time it was replaced by a much lighter weapon. This makes possible the parry, feint and lunge; the latter having been discovered by di Grassi, an Italian fencing master of the sixteenth century.

There are two schools of fencing, the French and Italian. Frenchmen are the superior fencers. To fence well in accordance with the French school one must acquire great skill, tech-

nique, delicacy of touch and the finest foil play possible. A good Italian fencer must be a Hercules; for in this school one is taught to overpower one's opponent by strength. Politeness, agility and sensitiveness of touch help make the French fencer the superior. As far as strength is concerned, a woman might develop into the best fencer. Grace, quickness and skill are most required to make a good fencer of the French style.

Some people maintain that fencing is a one-sided exercise; they say that *scoliosis* is bound to result. This is not so if the proper positions are held. Notice any prominent fencing master, a man who uses the foil nearly all day, and nowhere will you see a man of better carriage.

In the position of "on guard" the shoulders are at an even height, the left arm is bent as well as the right, the left knee is bent equally with the right knee. When the lunge is executed the left leg receives as much or more exercise than the right, and the left arm is thrown down parallel to the left leg with just as much force as the right arm is extended. As one recovers from the lunge the left knee acts as a hinge and both arms are bent to aid in returing to the "on guard" position. The only difference that can be found in the right and left sides of a fencing master is in the right forearm. The extra weight of the blade and the movements of the muscles of the forearm give added strength to the tissues there.

Fencing requires a great deal of nervous expenditure. The rapid response that one must make to the various attacks of one's opponent and the ready *ripostes* and fresh attacks call for neuro-muscular control. One must quickly judge the weak and strong points of one's opponent and direct attacks and feints accordingly. To be keen and quick in foil play are essentials. A good fencer should make a better lawyer, a better business man or a better professor because of the exercise. The mind receives much work when one is fencing. As soon as one fails to be alert and ever ready with parries the battle is lost.

Fencing matches are most interesting to watch. The bout continues for four minutes, each contestant working for two



The Salute and chief movements in fencing.

minutes on each end of the mat. The change at the end of the first two minutes is for the advantage in the light. The fencer's mat is usually about three feet in width and less than twenty feet long. All the work is carried on lengthwise of the mat, never side to side. Stepping off the mat at one side or the other constitutes a foul. As soon as one of the competitors is touched, he should call out to that effect. Some men are slow in acknowledging good touches; in that case, the referee may award a few points to the other contestant. Form counts for a good deal in this form of exercise as in others, and mat etiquette has its points in form for or against a man.

Fencing is one form of exercise that cannot very well be learned from written instructions, but will require a personal instructor. The colored illustration on another page, giving a number of positions, will only indicate the general nature of the exercise, and that imperfectly, but cannot suffice to teach one how to fence. This will take one some time, for aside from the general form there are always a lot of little details which the pupil is likely to forget or overlook, and which he can scarcely hope to master without practice and the help of the instructor.

It is of course understood that the foil will be equipped with a "button," and that masks and gloves will be used. One should never attempt to fence without the mask, for it is dangerous. Women should also wear the padded chest protectors. Also thrusts, parries and movements should be thoroughly practiced and mastered before free fencing is ever attempted.

The different attacks and parries, tierce, carte, seconde, sixte, septime, octave, prime, etc., are so named because of the division of the torso into sections referred to in this way. The parry will be determined by the position of the foils in attack and the point aimed at. In parrying, however, the hilt of the foil is shifted just enough to deflect the thrust, while the point of the foil is held as nearly as possible where it was before, in order that it will be ready for a counter attack.

As an exercise, fencing has many points that strongly recommend it. The movements which it involves are so varied that it calls into play almost every muscle of the body. It also demands a marked degree of mental concentration. Those who are unable to devote their every energy to the occupation that they may have in hand can never hope to become successful fencers—unless, indeed, they find in the sport a means to acquire the complete control of their faculties. This is by no means unusual, and one of the most useful features of fencing is that it develops the mind and the body simultaneously, and tends to produce the all-around development which makes the ideal man or woman.

One of the most marked effects produced by a constant indulgence in fencing, is the remarkable degree of grace of movement it produces in men as well as in women. It is impossible to become an expert fencer unless one possesses, or acquires, a swiftness and certainty of movement, and ability to move in exactly the proper manner at exactly the proper moment, which at times appear truly remarkable. This statement applies more directly to exponents of the French rather than of the Italian school of fencing—although both methods have many strong points, and numerous staunch adherents to advocate them.

FISHING.—Fishing, under many conditions, is a lazy man's sport, though it at least has the advantage of taking one out-of-doors, and in some cases of lung trouble or of nervous weakness, might be valuable just because it is a lazy, restful sort of recreation. From the standpoint of exercise, there are two varieties of fishing which may be recommended, the first of these being deep water fishing from a boat, which may include a great deal of rowing, and which means a stubborn resistance upon the part of big fish. This will apply both to salt water fishing and that on the inland lakes provided with pickerel, pike and bass. A second form of fishing which provides good exercise is trout fishing in small, clear brooks which require that one keep moving up or down the stream almost continuously in order to get a catch. Scrambling

through dense brush all day long, up and down the bank of a stream, under such conditions, or even wading down the stream, which is usually better, will give one that appetite and that ability to sleep which prove the value of any true recreation.

FOOTBALL.—In speaking of football, no matter which form of game is referred to, one is safe in saying that it is one of the greatest, most vigorous and most fascinating of all team games, and the popularity of the different phases of football in those localities where they are known is evidence of the pleasure found in such stirring games. As a matter of fact, football is played all over the world, from Europe and North America to Australia and New Zealand.

Football is not a game for weaklings, either physical or moral. The man who is not heavy enough or strong enough to endure the taxing demands of this game should seek some form of exercise for which he is fitted. The man who does not have the moral stamina to control his appetites and his temper ought to take up fasting instead of athletics. Football is a game for men who have strong bodies, clear minds, and clean morals, and who desire a thrilling sport which will tend to develop sturdy manhood.

The right kind of a player, one who goes into the game to



Line-up of football teams in the American Intercollegiate game. Backs behind these lines. Bodies of all players, except the center, must clear points of ball.

do his best, win or lose, who strives in every way to bring honor to his team and true development to himself, may have a few bruises, and sprains, or even a broken bone among his fond recollections; but he will also enjoy satisfying memories of happy experiences on the athletic field. He will appreciate the fact that there he received most excellent training for use in his honest struggles for true success. Football helps to develop a strong, healthy body, a quick, active mind, and a character of courage, fairness and self-control.

There are three important phases of football, though two of these are really modifications of each other. On the one hand we have "Soccer," or Association football, the straight kicking game, and on the other we have the two divisions of Rugby football. The original straight Rugby football is played extensively in the British Isles and in most of the British Colonies, though very little in the United States, whereas the great national autumn game in the latter country is what may be termed Modified Rugby, though it is now so different from the parent game that the term Rugby is almost never applied to it. It is sometimes referred to as "Intercollegiate" football, to distinguish it from the other phases of the game, but when the simple term "football" is used in America, this is the variety understood.

Soccer.—The Association football, more commonly known as "Soccer," is the same in all countries, and is very, very far from the nature and style of play of Rugby, and especially from that of the American game. Association football is really a true *football* game, inasmuch as the ball, a perfectly round one, is handled almost entirely by the feet, kicking or dribbling. It cannot be carried; cannot even be touched by the hands or arms, except by the goal-keepers, though it may be bunted with the head or any other part of the body, exclusive of the upper limbs. It is a kicking game throughout, and it not infrequently happens that when a player is unable to reach the ball with his feet, he drives the toe of his boot instead into the shin of a more successful, though in this respect unfortunate opponent. What is known as Gaelic football is

very popular in Ireland, and also among the foreign-born Celtic population in America. It is a variation of its own, though similar in many respects to the Association game.

In Rugby, however, while the ultimate aim of each side is to advance the ball to the goal of the opposition, yet it may not only be kicked, but may be carried, or even thrown in a backward direction from one member of the team to another, in order that it may be carried farther forward, it being left to the opposing team to stop the ball or the man carrying it if they can. And this, in the main, is the plan of American football, with some notable differences in the rules and style of play. The ball in both cases is oval in character.

There are scrummages in both games, although the "scrummage" as Americans know it, and as they term it, is radically different in formation and action from that of the Rugby game. There are similar rules in regard to "off-side" play, with penalization for offenses in this respect. There is in both games the passing back of the ball from the scrummage, to be put in play by the backs, these passing it to each other as the action of the play may demand. After this either kicking or carrying the ball is in order.

A football team consists of eleven players in the American game, while in Rugby there are fifteen, though it is sometimes played with thirteen on a side. Rugby is the more open game of the two, and, possibly, the faster. In the Intercollegiate style of play there is a rather close formation of the entire team, with a great deal of man to man resistance when the ball is put into action. A few years ago the game was almost entirely a pushing, straining series of so-called "mass-plays," but on account of the frequent injuries due to this style of play there is again a tendency to more open play with more frequent kicking, or in other words, a partial return to some of the more distinctive elements of Rugby.

Intercollegiate. The American game is often said to be dangerous. It is certainly true that it is rough, but for those who know it the game has a certain charm and fascination that is not associated with any game less violent.

It offers many of the same advantages that wrestling affords for physical development, though it is more violent and apparently of greater interest from the fact that the contest is not merely between two men but between two diminutive armies, each, however, working with much of the same co-ordination and unity of action with which a single individual would employ the various members of his own body.

The action is as nearly continuous as one could wish, the brief pauses between the scrimmages merely affording that momentary relaxation which enables the contestants to endure the tremendous demands upon their strength.

The formation of a football "eleven" in the American game, when engaged in offensive play, consists of a "line" of seven men, for protecting the "backs" while the ball is put into play, and behind this line a "quarter-back," two "half-backs," and one "full-back." These are all grouped usually within five yards of the "line," which consists of the "center," who holds the ball and snaps it back when ready for the play, two "guards," one on each side of "center," two "tackles" next and outside, two "ends." Everything depends upon team play, and the various members of the team must work as a unit. Secret signals in the form of numbers and letters called out by the Captain are used in order that each one may know what the play is to be, while keeping the opposing team in ignorance of it. It may be either an attempt to plunge and push directly through the other line, a run around the end, a kick, or some variation of these. On defensive play, the line is about the same, though the backs may shift to any positions, sometimes much wider apart, for the purpose of interfering with and stopping the attempts of the attacking team to advance the ball. It would be almost useless to take up in detail the rules and methods of play, inasmuch as the rules are changed considerably each year by an Intercollegiate Rules Committee. The game is still in a state of transition and evolution and will probably be modified a great deal more for years to come before it settles down to anything like that permanency of organization and style of play that prevails in baseball.



The general style of "Rugby" football, showing a "scrummage" at the top.

Rugby. In the disposition of a Rugby team, there are usually eight of the men detailed for duty in the scrummage. This varies sometimes, as in the case of the New Zealand teams, in which only seven men are used for this purpose. The scrummage is also called the "pack," a term which is also applied to the act of lining up in place for a scrummage. It is the business of the scrum men to hold the opposing pack until the ball has been "heeled out" and put into play by the backs, after which they break up and render any further service possible in any part of the field. They are also known as "forwards," in contrast to the names of the half-backs and the others. Of half-backs there are two, one of whom, known as the "scrum-half," occupies a position which has some relation to the duties of the quarter-back in the American game. The scrum-half, just back of the pack, gathers the ball as it is heeled out of the scrummage, and transfers it back to the other half, who then will probably determine the character of the play from that time on. In most cases he will find occasion, either at once, or after a short run, to pass the ball back to one of the "three-quarters," of whom there are four, forming a line across the field in the rear of the half-backs. Back of the three-quarters, and completing the membership of the team, is the "full-back," whose especial and sacred duty it is to defend his goal against attack, though also to render any other service that may come within his power. The most active and conspicuous members, therefore, are usually the half-backs and three-quarter-backs.

One may be sure that after a ball is heeled out of the scrummage and put into action by the backs, the opposition are not idle, for it is as much their purpose to stop the advance of the ball as it is the desire of the possessors to accomplish that result. Whenever possible, the ball is intercepted by the enemy during a pass, but this is seldom, and tackling must be resorted to. But just as one tackles the man carrying the ball, or the instant before, he will contrive if possible to pass it back to the next three-quarter behind him, who will in turn endeavor to carry it forward, pass it back yet again, or perhaps, punt

it down the field, as the circumstances demand. The statement that it is passed back does not mean directly back, but more usually in a sideways direction, though slightly backward, and never in a forward direction.

Such perfection in team work is accomplished that the runner does not need to turn to see his team-mates behind him when compelled to pass the ball to them. They will see to it that they are there, and he takes it for granted. Furthermore, he does not pass the ball directly to the point at which they are located at the instant, but usually a couple of yards in advance of that point, so that they can catch it while running at full speed and lose no time. Passes are usually made with both hands together, a one-handed pass being unreliable. Great precision and skill in passing is acquired, and it is a sort of unwritten rule that the ball is to be passed and caught while in full speed. The manner of advancing down a field in the face of the opposition is partly suggested by the tactics used in basket ball in America. Strategy goes a long way in Rugby, as in all sports.

When the ball goes "out of bounds," as we express it in America, it is said to be "in touch," and the play is stopped for the moment, being presently thrown in by a member of the other side. This is called the "line-out," the players taking positions opposite the point at which the ball went in touch, and one player throwing it in.

When the man carrying the ball is too thickly beset with tackling adversaries, and finds no team-mate at hand who can advance the ball better than himself, it is usually good policy to punt, and often to punt in touch. This is a safe manœuvre, particularly if his own goal is threatened. The full-back, always a strong kicker, most frequently has occasion to punt in touch, and thus place his goal out of danger for the moment. Rugby football is played intelligently for the most part, but sometimes unintelligently, as for instance when the unschooled members of a team waste much energy in passing a ball all across the field without an advance. They have seen the ball passed by other players, perhaps, and go about wildly passing



An illustrated lesson in scientific golf-playing.

because that seems to be a part of the game, but without any advantage being accomplished through their efforts. A ball should be passed to another only because that other will be in a better position to advance it than the individual relinquishing it.

Speed and skill are at a premium in Rugby, while in the American version of football weight and strength count for a great deal. The school boy who wishes to take up this game should first undergo a preparation of special training by systematic exercise in order that he may harden and strengthen his body for the tough usage which it will receive in this rigorous though splendid game.

GOLF.—It is said that in order to make the rounds of the holes of a golf link, one has to walk about ten miles, this distance, of course, including the deviations due to badly driven balls. While the player may not always be called upon to undertake a journey of this length, yet walking and golfing are inseparable, which accounts for much of the latter's healthfulness. If a sport leads one unconsciously to take a good deal of fine exercise, and that too without feeling fatigue during the effort, you may depend upon it that it is of an ideal nature in an athletic sense. And this golf does. If one feels tired it is only *after* the game, and not while one takes part in it. The sleep which follows is that which waits only on him who has honestly and healthfully earned it, and such sleep, by the way, is a sure sign that the sleeper enjoys a high degree of vitality. Broken rest is due to causes which tend to lower one's vitality. Insomnia is nothing more or less than a manifestation of a nervous condition produced by a disturbance of one's mental and physical poise, or in other words, an upsetting of normal vitality. Golf is a great game to abolish such a condition. One never ceases to learn the game, which is the same thing as saying that it makes a continual demand on one's mentality. It offers so many developments undreamed of by the novice that one may play for years and learn something, on every occasion. The unexpected situations which it creates and the unlooked for eventualities that it presents keep the

mind pleasantly busy, and here again we have another reason of its mental healthfulness and why it adds to one's vitality. To properly "address" one's self to the ball, which means that the player must place himself in the recognized position to strike the ball, to know how and when, and why to use the cleek, the brassie, or the lofterer; the mashie, niblick, driver, or putter; to learn how to "slice" or "pull," to make due allowances for wind strength, to avoid the perils of bunkers or hazards in general, to know how to "honor" with credit and skill—these are but a few of the things that go to the making of a skillful player and, incidentally, add to his vitality while he is learning them.

Then there is the actual exercise which is demanded. To the unknowing, it may seem an easy matter to strike a ball with a club especially made for that purpose. As a matter of fact, the reverse is the case. To learn properly to handle a club, that is to say, to "grip" it, is in itself a portion of golf technique, which calls for careful training on the part of the tyro. Then, again, each club is only suited for a given purpose and must be used in a special way. At present, what is known as the overlapping grip seems to be the favorite with professionals and advanced amateurs. With this grip, the fingers of the right hand are placed below the left on the handle of the club. By this means the amount of work and responsibility of each hand is properly proportioned; for where it is otherwise, a stroke is apt to go wrong. Sometimes it is necessary that the right hand shall be the controlling factor and sometimes the left, according to the nature of the stroke. This is instanced as an illustrative fact of the technical difficulties which surround golf and make it the game which it is.

In making a stroke of almost any kind, the amount of muscle effort that is used, together with the mental concentration, are far more than the outsider realizes. Suppose that the player is making his drive from the tee, which, as the reader probably knows, is a tiny eminence made of sand. The object of the drive is to send the ball in the direction of the nearest hole and in order to do this the player must not only put

a good deal of force in the blow, but he must also see to it that he so hits the ball that it flies in a straight line. In order to do this, the club must describe a swing downwards and onwards, so as to strike the ball from the tee, and then, without ceasing its forward motion, continue on and away to the left. There must be no break in this motion. The point is, that this long, clean, slashing stroke, with muscle and mind behind it, constitutes a form of athletic movement of the best and, as a consequence, assists in the making of vitality. What applies to the drive, applies almost equally to other strokes, each of which calls for a vigorous movement.

Aside from the great constitutional benefits of the game due to the walking and outdoor air, these various movements of the arms in swinging the clubs afford splendid exercise for the muscles of the chest and shoulders, and also, to a lesser degree for the back and sides. There is no game that can be more highly recommended, and especially for those who have passed the age at which violent exercises are attractive.

HAMMER THROWING.—See *Weight Throwing*.

HANDBALL.—Handball is one of the fastest of all games, when played with energy, and offers such a combination of exercise that it is valuable for every part of the body. In its activity and benefits it may be compared to basket ball, though the general scheme of play is entirely different. It requires the use of both arms at different times, great activity of the legs, and vigorous use of the back muscles when stooping for the low balls. It is a game that may be played either indoors or outdoors, though most frequently and most advantageously outdoors. Wherever a brick wall or any other smooth wall may be found, with level ground in front, a handball court may be improvised.

The bare hand is used to strike the ball, but instead of striking it over a net, as in tennis, it is batted against the wall, bounding back with great speed. Players on the two sides must strike it alternately, keeping it going, and to miss is to yield a point to the other side. It must be struck on the fly or on the first bounce.

Lay a book on the table. Open it in the middle till the cover you have in your right hand is at right angles to the other cover—there you have a model of a front wall and floor of a handball court. A line across the floor a third of the way between the wall and the back line is all the marking there is to the court. This is the “ace-” or service-line. In size a court may vary anywhere from ten by fifteen to fifteen by twenty-three feet.

The theory of the game is that the player's whole attention is devoted to placing the ball in such a way that his adversary cannot so return it, and so loses the point. The ball must be continually kept in motion, and in no instance may it be caught, or struck with both hands at one stroke.

For practical illustration, let us say that A and B are about to begin a game. They toss a coin for serve and A

wins. In handball only the server can score points; he continues to serve until he is put out, *i. e.*, fails to return a ball properly. A, the server, stands back of the “ace-” or service-line, anywhere he pleases, drops the ball with one hand and strikes it against the wall. He has two tries to make it fall into the court between the service-line and the back-line. If he fails in both attempts he ceases to be the server and changes places with his opponent.

If he does make a proper serve and the other man returns the ball to the wall in such way that the server fails to get it



Handball Champion Michael Egan recovering a low ball. Showing proper position of hand.

back, he is "put out" and has to give up the serve to the other man. In that case no one will have scored a point—for only the server can score. The man who scores twenty-one points first wins the game.

The whole object, then, is to become the server and keep the serve. And naturally the serve in handball, as in tennis, is a very great advantage. There are men, not particularly skillful in the other departments of the game, who have acquired great skill in delivering a serve so difficult to handle that they can win from men who really know much more about the game as a whole than they do. And herein consists one of the attractive features of the game and one which makes it so well adapted to men of all ages—the fact that head work is worth almost any amount of strength and agility with judgment lacking.

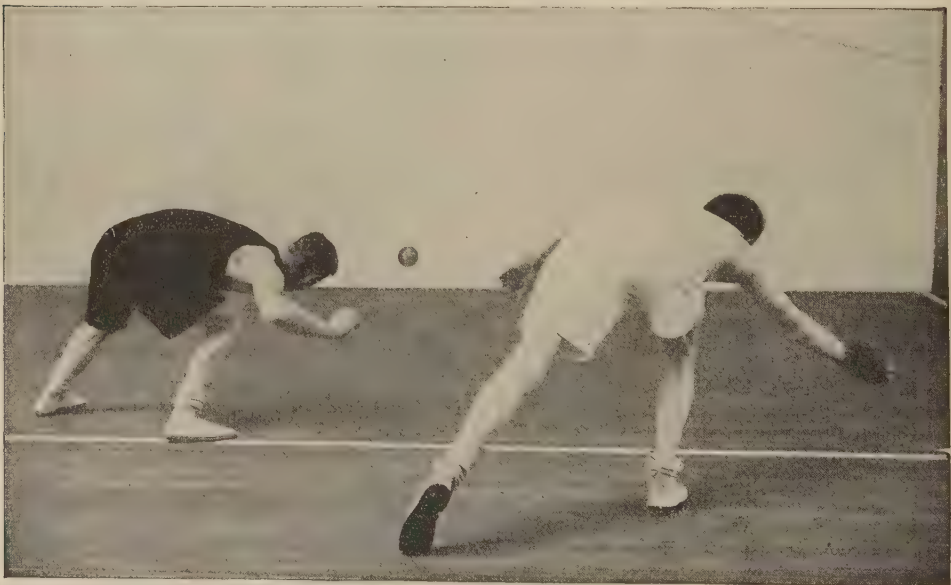
As in tennis, there may be anywhere from five to fifteen plays in a rally before the point is finally decided. Back and forth the players go, first one driving the ball high up on the wall to force his adversary back in the court, then perhaps shooting it low on the wall in an attempt to make a "kill." Continuously the eyes of both players follow the ball, and, with an intuitive sense where A is going to drive it, B manages to make his return and keep the rally going until he himself can make a try for a "kill." That is the give and take of the game; skill matched against skill a dozen times, perhaps, in the deciding of one point—at the play's end the satisfaction of one of the players in having sent back the ball in such a way that his antagonist couldn't handle it.

The "doubles game" is much less strenuous, and as it gives four people a chance to use the court instead of two, is more generally played. Handball doubles are played similar to tennis doubles. A and B play against C and D. The former are the servers, the latter receive. A goes in and serves; if he is put out, B gets a serve. If B is put out, too, the sides change places and C and D each get a serve.

In a properly played game of handball doubles, A and B are supposed to divide the court with an imaginary line and

each covers his own half. Utter confusion of the game follows the attempt of one partner to encroach on the other's territory. Once in a while, when, perhaps, A has been forced into the back court, it may save the point for B to rush across and take a return that his partner seems too far back to handle. But nine times in ten unless a "kill" can be made, the result will be confusion and eventual loss of the point. If players could be made to realize this one thing, the standard of all the handball doubles played would be improved.

There are certain general principles to be observed by beginners which will raise the efficiency of one's games in a striking degree. In the very first place, cultivate a "loose-handed" way of hitting the ball—the arm should never be rigid and should snap the ball rather like a willow withe than strike it stiffly, as with a baseball bat. The stroke of some of the best players is almost as though they caught and threw the ball each time. It is almost impossible to have the arm too much relaxed. Keep the hand open, the wrist swinging free. Hit the ball with the upper



Photograph Paul Thompson, New York.

An exciting moment during the game—the player on the right has just made a difficult return, and the one at the left is planning to "kill the ball" into the left-hand corner.

part of the palm, just where the fingers begin. In delicate shots use the fingers freely. It is wonderful what accuracy their careful manipulation will give.

So much for the way of hitting the ball; now as to the question of your position. And right here is where handball differs essentially from most other games. In golf or in tennis, for instance, unless you adopt the *right way* of hitting the ball you can never make much progress. In handball it is different. There simply is no right way or wrong way. The only rule to follow is to find out which style suits you best and then to develop that. If you have started playing overhand or running back and taking everything underhand, and it comes natural to you, stick to that.

Too much attention can hardly be given to the use of the left hand. In doubles where you only have to cover half the court you can scrape along pretty well with your right only, but in singles it is indispensable that your left hand should be good enough not only for defensive work but to earn points with. Use your left hand continually in practice games when you are just knocking the ball around the court. The ability to place the ball with the left will undermine the strength of your opponent's game to a greater extent than you might imagine.

An excellent outdoor court may be arranged by using an even, unwindowed wall of a barn or other building, and making a level floor of smooth lumber, or as a last resort, of closely packed and well-rolled clay, although, of course, wet weather will play havoc with the court last mentioned. Unquestionably side walls will improve any court by preventing the ball from going out of bounds. Given a hard, even surface of wall and floor of court, you need do no more than mark the service-line at the proper point of one-third of the distance from the wall and the back-line of court. Thus, if your court is twenty-one feet deep, the line will be seven feet from wall. An indoor court may be arranged even more easily than an outdoor court by following these plans.

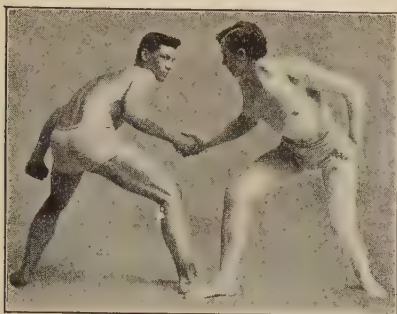
The regulation handball measures one and seven-eighths

inches and weighs one and five-eighths ounces, but a ball much lighter in weight and even a trifle larger in size may be used. In fact, many claim that the lighter ball involves playing a more strenuous and active game than does a ball of greater weight.

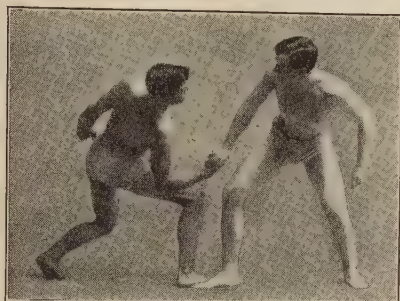
HAND WRESTLING.—This is a very interesting form of exercise, and one which affords a far greater amount of vigorous resistance than would appear in merely looking at it for the first time. Between two strong and well built contestants it becomes a truly strenuous pastime, although it must be said that success depends almost as much upon skill as upon strength.

The two competitors simply grasp hands, as in a handshake, but well poised upon their feet, and each with the right foot placed just outside of the right foot of the other. Before commencing the bout, the hands should be midway between, or just over the position of the feet. When ready, each tries to dislodge the other from his position, by pushing, pulling or jerking sidewise. To move either foot, or to place a hand, knee or any other part of the body upon the floor, will constitute a fall. Sometimes, when opponent is pushing hard, by suddenly releasing resistance one may contrive that his own momentum shall throw him off his balance, and the same in pulling.

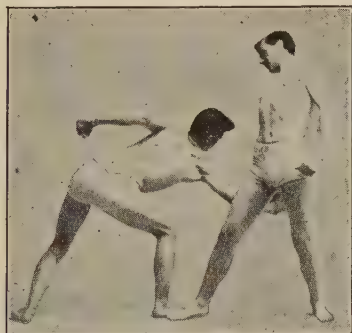
There is one important point to be considered in hand wrestling, namely, that one should engage in left handed bouts just as frequently as in right handed, in order that both sides of the body may be developed equally. A bout is continued until either one or the other loses his balance, moves his feet, or touches either the floor or his opponent with any other part of his body. The illustrations herewith present some suggestions. Hand wrestling is a pleasant recreation that can be indulged in anywhere, from the parlor to the lawn, and is suited to competition between those of opposite sex. It frequently happens that a woman with a little practice and skill can overcome the superior weight and strength of a less skilled but powerful masculine adversary.



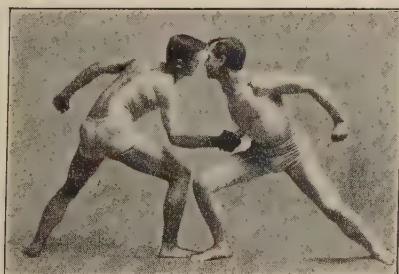
No. 1.—Position at beginning of hand wrestling bout, feet placed against each other, and hands directly over the feet, so that neither has the advantage in starting. From this position each may pull, push or jerk to either side, as he may desire.



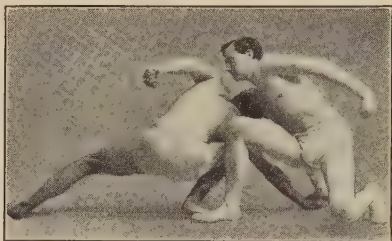
No. 2.—Illustrating a quick pull to the near side, which in many cases will throw opponent off balance. One must be careful, however, lest he lose his own balance.



No. 3.—After opponent has pulled hard, straight back, to the position illustrated, a quick jerk to the far side will frequently unbalance him. In this photograph he is about to step backward. It is well to keep pretty well down and braced on both feet. The erect position is a disadvantage.



No. 4.—Both contestants pushing hard against each other, a condition of hand wrestling which permits of the use of one's full strength. Sometimes one can simply push the other off his feet. The same applies to straight pulling.



No. 5.—A possibility which follows No. 4. While pushing hard against opponent, suddenly cease all resistance and give him a smart pull. His own force will help to precipitate him.



No. 6.—A clever trick, not unlike the Flying Mare in ordinary wrestling. With a sudden pull upon the arm of your opponent, partially turn your back to him, though without moving your own feet, getting his arm over your right shoulder and fairly lifting him off his farther foot, in the manner illustrated.



No. 7.—Showing a method of resisting the trick shown in No. 6. At the first sign of his intention, and before he is able to execute his plan, drop well down in the crouching position shown, resisting with all your weight, and he will probably be unable to move you. A quick jerk to the farther side, thereupon, will probably dislodge him.

KICK DOWN

Side-Throw

Wrist-Twist

Attack from behind position I

position II

Attacker about to be thrown

Stomach-Throw

The game
of
"Ju-Jitsu"
as played by
the Japanese School of Ju-Jitsu

Neck-Lock from underneath

Various holds in Jiu Jitsu.

Jiu Jitsu. This is the name of a system of self-defense in which the Japanese have become very expert. It is not, properly speaking, an exercise for the building of health and strength, but so much has been said about it in recent years that it is mentioned here. It is true that there is a certain amount of good exercise involved in its practice, and that one must be physically competent and alert to make use of it, but its fundamental principle is that of physical injury rather than of benefit. It is more or less of an art, a bone-breaking, tendon-twisting, ligament-lacerating art, designed to apply one's strength to parts of his antagonist which are weakest and least capable of resistance, also aiming deftly to turn his own strength against himself. There are all sorts of wrist twisting, joint dislocating and fancy methods of throwing an attacking adversary, though it may be said that most competent wrestlers know many such tricks, and really have nothing to fear from a Jiu Jitsu artist. For others, however, it is an excellent means of self-defense.

HARES AND HOUNDS.—See *Running*.

HOCKEY.—*Ice Hockey* is naturally confined to localities that have cold weather, and where skating can be enjoyed. It can be played on pond, lake, or river, or indoors on artificial ice—in fact, in any place where ice skates can be used. A team is composed of seven men, who are equipped with skates, and with long crooked sticks like “shinney” sticks. These are, however, broader at the end than the sticks used in the more simple parent game.

Each side chooses a goal, which is made up of netting, held by uprights, and the idea is to send a rubber disc called a “pluck” into one of these goals. The game is played in two halves of from fifteen to thirty minutes, and the team scoring the most at the end of the game is adjudged the winner of the contest. The men are on the go continually, and except for occasional pauses are playing at all times.

To become a first-class hockey player it is necessary to be a first-class skater, but this comes in time, and is acquired

with practice. By the beginner, hockey should be taken as a form of exercise, and one must not try to be an expert in a short time. Playing for amusement is always the best policy.

Skating outdoors and playing hockey brings a ruddy glow to the skin, and even if not practiced for more than twenty or thirty minutes a day will bring results that will surprise even the most pessimistic.

Shinney or Field Hockey. This is virtually the game of hockey played upon land instead of upon the ice, the original form of the game. A bent stick is used not unlike the hockey stick, though the game has never been developed to the same extent as the great game on the ice. It is of a more informal sort, usually played by boys, and not uncommonly in the streets. It is still played considerably by school-boys throughout the middle west of the United States. There is no special rule as to the number of players, for any number can pair off and play it. A small hard rubber ball is the object of play, though sometimes a small block of wood will answer the purpose. It is a lively, scuffling, racing game, as



Photograph by Underwood and Underwood.

A strenuous moment in a game of ice hockey.

one might expect, though not so fast or scientific as hockey on the ice.

HORSEBACK RIDING.—Horseback riding is a splendid pastime not only for taking one out in the open air, but for the sake of the muscular exercise which it involves. Men of the saddle are nearly always vigorous physically as the result of this one form of exercise, except, as in the case of some of the cowboys of the West, when the indulgence in alcoholic beverages and other deleterious habits offset the good accomplished by their riding. Arabs, Cossacks, Indians and famous riders in all parts of the world are invariably men of magnificent physique.

It is true that every one is not in a position to adopt this form of exercise, but it is so beneficial that one should not neglect the opportunity. Any horse that is suited to the saddle should be used in that way as much as possible, rather than merely driven around with a buggy. Even the walk of a good horse, when you are astride, is better than sitting in a carriage. "Single-footing" is a very pleasant exercise if one has the right kind of an animal, but a good, comfortable gallop is the very best of all. It cannot fail to strengthen the legs, the back and the abdominal muscles. To ride well, one should learn to allow his body to conform properly to the motion of the horse, rather than trying to resist it. In the gallop, instead of leaning awkwardly forward and being jolted a few inches off the seat with every stride, one should sit back in an erect position, overcoming the jolting motion by the flexibility of the body, and in this way avoiding any jar as well as sticking to the saddle. In this way the impetus will be felt to be forward rather than upward. The sense of tremendous animal vigor which one experiences upon the back of a spirited horse is both gratifying and inspiring.

Equestrian Polo is a very thrilling and valuable game, played on horseback, and with the object of sending the ball through the opponents' goal. Clubs are used, something in the form of a long mallet. Aside from the essential exercise involved in playing the game, the horsemanship re-

quired is of a very high order, and the mere riding through a game of polo upon a pony active enough to be of service in this game, will provide exercise of the most vigorous and satisfactory kind. The game is really limited to those of considerable means, however, and therefore can never become very popular among the masses. There are plenty of other satisfactory games that do not carry with them the same expense. A good polo pony is a rather high priced animal to start with, and the grounds and other requirements of the game are not always to be had.

HUNTING.—Hunting is a very popular sport in many quarters and unquestionably has great value as a builder of health. It involves an unlimited amount of tramping in the open air, through the woods, over hills, sometimes on mountain sides, and the natural exercise of the walking and climbing is accentuated by the fact that one has something to carry, always the gun, usually some provisions for lunch, and sometimes the game. It is not a violent or vigorous exercise, but is especially good for constitutional benefits because it takes one out-of-doors for all day, in most cases, and sometimes for weeks at a time.

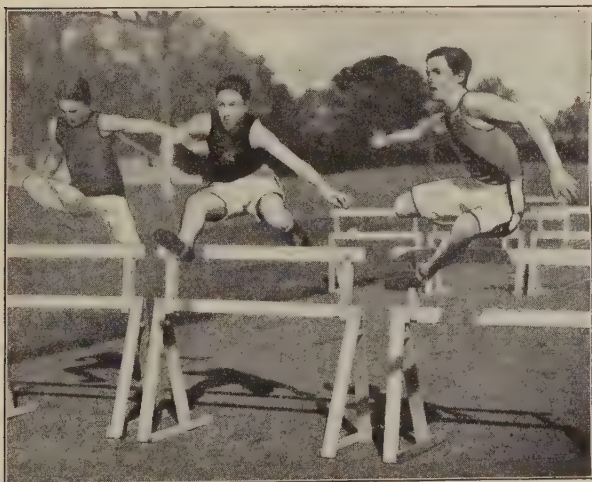
There are many who could not consider hunting as a recreation because of its cruelty and inhumanity, but while this is to be deplored, there is no denying the fact that it is of a nature to build health and vitality. In this connection, however, it might be well to offer a personal suggestion to those who disapprove of hunting on ethical grounds, namely, that hunting with a camera is equally good exercise and in most cases more attractive sport than hunting to kill. A good snapshot camera will cost less than a good gun, and the incidental expenses are no greater. One can always find pleasure in an outing with the camera, and if no game is available, then one can always find beautiful scenes which are worthy of bringing home through the instantaneous impression upon a film.

HURDLING.—Hurdling is a combination of running and jumping [which see] which makes a spectacular contest. The aim of the hurdler should be to get over the hurdles as smoothly

as possible, and without any more interruption of his running stride than necessary. The form of jump employed, therefore, should be as much like a big running step as possible, and the ideal form herein described approximates this essential.

It should be said that the first and all important quality for good hurdling is speed, and hurdlers are therefore always fairly good runners, though there must be a combination of running and jumping ability. But since speed is the great essential, the athlete who is training for a hurdle race should devote most of his attention to sprinting, so that he may develop speed. About twice each week he should practice on the hurdles.

The two most popular and most frequently contested hurdle races are the 120-yard and the 220-yard hurdles, often called the "high hurdles" and the "low hurdles," from the fact that in the 120-yard event the hurdles, ten in number, are three feet and six inches high, while in the 220-yard event they are two and a half feet high, also ten in number. In the latter case they are placed exactly twenty yards apart, with twenty yards to run from the start to the first one and twenty yards from the last one to the finish line. In the high hurdles, they are placed ten yards apart, with fifteen yards to run from the



A spirited and well contested hurdle race. The boy in the center shows the best form, the forward leg extended straight over, and the other leg trailing.

start to the first hurdle and from the last hurdle to the finish. They should be sufficiently light in construction so that if one does not quite get over them he will knock them down, rather than tripping himself for a bad fall.

In the high hurdles, it is neces-

sary to run with an even stride, always numbering the same number of steps between the hurdles, either four or six, but preferably four, if one's stride is powerful enough and long enough, so that the leap will be made in each case from the same foot. In other words, the thing must be systematized. Young school boys will necessarily run six steps between the hurdles, and unless they can do this they are not big enough for hurdles of this height. Speed depends partly upon economy in jumping, and one should not waste time or strength in jumping an inch higher than actually necessary to clear the hurdles. Practice will enable one to master this phase of it.

As I have suggested, the leap should not be so much like an ordinary high jump as like a big step over the hurdle, one which will as little as possible interfere with your running action. Upon alighting on the forward foot you should be in a position to continue your running as though you had not



In leaping the hurdle the free or front leg should be extended straight forward over the bar, the other leg, from which the leap is made, trailing behind, the hurdler trying to jump no higher than absolutely necessary to get over. He lands on the forward foot and continues running as though his running action had not been interrupted by the leap. In short, it should be as much like stepping over as possible.

made the leap. The old style of hurdling was to curl the forward knee sideways and inward, trailing the rear leg, but the new plan now used altogether is much better. It is to raise and extend the forward leg straight over, as though stepping over, trailing the rear leg from which the leap has been made. It will help in many cases to hitch the arms upward at the same time, with the action of sailing over the hurdle.

If one has speed and can master hurdling, it is a good branch of track athletics to take up, for there are not many who become proficient in it and there is less competition than in the sprints and the other runs. There are sometimes hurdle races for a quarter mile and other distances, but the two named above are the standard events.

ICE-BOATING.—For those who love the open air, and especially the bracing touch of winter, there is scarcely anything more exhilarating than ice-boating. To travel, or rather to fly—for that's about the feeling—at the rate of fifty or sixty miles an hour with the near-zero gale that your motion has brought into being stinging your face; to feel sometimes your deck rise to an angle of 45 or 60 degrees as a squall hits you on the quarter while you buzz along on one runner—to keep your eyes open meanwhile for air-holes and rotten ice and speeding rivals—all this is an experience for the novice, and a delight for the strenuous. It is great sport and picturesque at that. There are few sights more striking than a fleet of racing ice-boats.

Allied to the ice-boat, but built to overcome conditions that would make that craft useless, is the scooter. This is a combination sloop and ice-boat that is found on the Great Lakes and the Great South Bay of Long Island. Originally designed for the use of winter fishermen and duck hunters, its sporting possibilities were later realized and nowadays scooter races are a recognized sport in the localities in question.

The craft is equally at home on ice or water. If, when sailing, it encounters a stretch of the former, it simply lifts itself thereon by means of the curved runners with which it

is equipped and skates or "scoots" along until it meets with water again, when it slides off into that element and becomes a sloop until ice appears ahead, when it repeats the process.

It is not to be thought that the open air is all that one gets in ice-boating, for there is often a deal of exercise in manning the craft. Often, when the wind tends to tip her to one side, it is necessary to hang far out on the other side to maintain balance.

JIU JITSU.—See under *Hand Wrestling*.

JUMPING.—There are two varieties of jumping commonly practiced in competition, the high jump and the jump for distance, called the "broad jump." These are both made running and standing, but the standing jumps are not used much in competition, being much less satisfactory and enjoyable to both spectator and performer.

The running broad jump requires speed most of all, and the successful broad jumper is always a fairly good sprinter. With a given lift into the air, the distance that one will move before coming down will depend absolutely upon his horizontal speed, as a matter of physics. And for this reason the broad



The high jump. The upper exhibit shows splendid form for the sidewise style, but the lower photograph illustrates one of the awkward styles often followed by beginners.

jumper in training should devote most of his attention to sprinting, practicing the jump not more than once or twice each week. Besides, broad jumping is a bit hard on the knees, and they should not be put upon this strain every day.

The jump is made from a take-off, a piece of timber planted crosswise and level with the running path, and the dirt cut away from the farther side. The dirt should be dug up loosely with a spade so as to be soft for landing. The first thing to do is to measure one's running paces, placing a handkerchief or other mark at a distance of eight or ten running strides from the take-off, so that you may be absolutely sure of reaching the take-off with the preferred foot each time. Experiment will determine this, and after a preliminary run to the handkerchief or other mark, a sprint is made from that point, according to the previously measured strides.

Having reached the greatest possible speed at the take-off, it is only necessary to get the upward lift in the jump, getting up as high as possible. Upon jumping you should raise your knees high, even to the chest, with the upper body and arms thrown well forward, and extending the legs again before alighting. This control of the body should be practiced a great deal in easy, moderate but rather high leaps, until the action is a matter of habit. You will then have the right form and will be ready to make real trials for distance.

The running high jump requires very little running, just a few easy steps sufficient to get a good spring and the horizontal direction to carry you over the bar when you reach the proper height. The essential thing in the high jump, aside from the necessary lift, is to get the legs up and out of the way when going over. The easiest and most popular form is a sideways jump, throwing one leg over first and following with the other. It requires practice. A very effective form is one in which the free leg (that from which the spring is not made) is thrown up forward over the bar, the body turning with the other side down and the other leg doubled up, so that the jumper alights with the body facing the bar. The aim is not to go over in an erect and perpendicular attitude, but to

shoot over feet first, so to speak, so that the upper body may incline toward the horizontal. To jump a bar at five feet does not mean that the entire body has been elevated five feet, that is to say, that the center of gravity has been raised this distance, but perhaps that the center of gravity has been raised possibly three feet, and the position so shifted that dangling legs and other parts all get over. The most expert jumpers acquire a knack of getting practically the entire body in a perpendicular position going over the bar, jumping sometimes over six feet high, but the art of accomplishing this is so intricate that it would be difficult to explain or make it clear in print. [See also *Hurdling*, and *Ski-Sliding and Jumping*.]

Leap Frog. Leap frog is a good active game for boys, and naturally just as good for adults who are willing to forget their dignity for the sake of health. The simple and most common form of leap frog is the continuous running line, in which all take positions with backs bent over, hands on knees, while the last in the line vaults, straddle fashion, over each, finally taking his place at the front of the line, while the next one last in line proceeds in the same way, and so on indefinitely. A more exacting form of leap frog is one in which one man is down in a specified position, while the others take turns in trying to vault his bent back. A special take-off for the leap is provided, a leader setting the position to be occupied by the man who is down. The leader first vaults from the take-off, followed by the others, but he marks the landing place of his rear foot as the place for the man "down" to stand for the next series of vaults, naturally more difficult because of the longer leap. The first one who fails to get over properly, vaulting and placing one hand on the back, is "it," and must be "down" for the next series. As he is placed farther away from the take-off, the leader may specify, one step and a vault, or two steps and a vault, first doing it himself. The poorest jumper or vaulter is "down" most frequently in a game of this kind.

LACROSSE.—Lacrosse is a game which is said to have origi-

nated with the Indians. It is now steadily increasing in popularity with American colleges. It is a great game for developing agility, quickness of eye and all-round vigor. It requires a large open field, and the ball must be played into a net-like goal.

Lacrosse is not a particularly hard game to play, but, as in tennis, the novice must be able to handle his stick well before he can learn much of the game. A stick used by an old player—a second-hand stick if it is in good condition—is better than a new one for a beginner. This is because, like a used tennis racquet, it has been well broken in by use and is not so stiff. In handling the stick, the beginner should always keep the ball close to the broad end of the stick, about a foot from the end, whether throwing or catching the ball, and well up against the frame. Should it be caught in any other position, immediately shift it to the proper position for a throw. This is for the short throw or “tip.” When a longer throw is made the ball is shifted lower in the net. Left-handed men can play as well as ordinary right-handed players, by simply reversing the side from which they throw.

Beginners should first try passing the ball from the stick up against a fence or the side of a building. Practice makes perfect, and, as in learning anything else, one has to keep continually at the game to master it. In throwing from the left side, the butt should be grasped with the right hand, with the left well up to the juncture of the net with the frame. Do not place the hands close together, as this gives less control over the stick. Move the arms freely and draw the stick well over the left shoulder, at the same time turning the body to bring the stick well forward while the ball passes out of the stick from the corner next to the frame. The stick should be given a light jerk upward at the same time, as this gives speed to the ball and projects it more accurately. As the ball leaves the net, draw the butt in slightly toward the body. The body must move with the stick, as this gives greater speed to the ball and insures more accurate throwing. By taking a step forward with the “off” leg, there will be less strain on the back and shoulder muscles.

The next thing is to learn how to get the ball from the ground as quickly as possible. Placing the ball about forty-five feet ahead, still holding the stick with the two hands, but lowered instead of raised, the player approaches at a sort of dog trot, bends the knees and scoops up the ball "on the wing." With a beginner the ball will run out, or he may pass over it too quickly. But he will have to keep practicing, because when he once gets the ball he will have to throw quickly, and to do this must have it in the correct position for a swift throw. If he reaches for the ball too soon when approaching it, the ball will bound out, or he will push it away from the stick. A quick bend, scooping it up with a cradling motion, does the trick and then the player is ready for a pass. He should also keep the stick away from a line with his body or he may be taken with a sharp poke that will hurt. Experienced players of course know how to make the approach at speed, so that picking up the ball and passing it are done so quickly that they seem like a single movement. Not only must he attempt to pick up and pass the ball, but he has an opponent who is trying to do the same thing, and the resulting collision of sticks and sometimes bodies is rather a heavy impact at times.

A fundamental rule, and one that obtains in all games where balls are used, is that hammered into the ears of every football player—"Keep your eye on the ball." A player should always keep in motion after he has once caught the ball—in fact, when playing toward the ball, if a player waits for the ball his opponent can come up and block his play, and if he steps backward the opponent has a chance to interrupt it before it reaches the expectant one. One must keep moving and step toward the ball, passing straight and hard, governing the speed by the distance between players.



"Ground scuffle" in lacrosse.

Twelve men comprise a lacrosse team. The position assumed by the player must be such that his left side is always turned toward the goal he is attacking. The positions are: inside home; outside home; first attack; second attack; third attack; center; third defense; second defense; first defense; coverpoint; point; goal-keeper.

The inside home man of the opposing team lines up against the point man, and so on down, as in Rugby football, in a straight line from center to in-home, with the defense placing itself according to the attack. The ball is started from center or "faced-off." The two centers place their sticks back to back on the ground with the ball between them. In beginning each center must draw his stick straight toward himself and the ball goes to the side getting it first on this move. Then he passes to his next man and it goes from one to another, according to the system of play until the ball is lost to the opposite side or is landed for a goal on the opponent's side.

Shooting a goal is as important as any other part of the practice. It is not sufficient to be able to land it in the six-foot square. The shot should be as accurate as possible, because interference often gives the player little chance to get an easy goal. He must take a desperate chance and so be able to land it by a narrow margin in a small space. He must be able to shoot the ball in close to the goal post or sides of the goal. Here is where wall or fence practice comes in again, for a player learns to catch the ball on a rebound and shoot it in again, as he would in a game if he missed the goal and the ball rebounded. The ball comes back so quickly from the wall that he learns to catch it quickly and get in another shot before the goal-keeper in play could recover.

LEAP FROG.—See *Jumping*.

MOTORING.—Although the automobile may seem to be a lazy man's method of getting about, as compared with such active exercises as walking and running or even cycling, yet the automobile should be given much credit as one of the prominent factors of recent years in encouraging a love for the outdoor life. Those who take very little exercise, and who other-

wise might be confined to unwholesome recreations indoors, at least get the benefit of delightful outings in these motor cars. And for the man who sits at the wheel of his own machine there is a certain amount of exercise for the arms as well.

Many business men accompanied by their families now take an airing after the close of the working day, when formerly they would have spent the same time smoking a cigar in a lounging chair at home, probably with little or no ventilation of the room. It is true that every one cannot afford to own an automobile, but for a large class of people motoring is a delightful recreation, and one conducive to their better health.

POLE VAULTING.—Pole vaulting is an exercise which requires a powerful development of the upper body, though it may be said that it requires as much art as it does strength. So expert have some athletes become, in this branch of sport, that the present record is nearly thirteen feet. The beginner should practice on a bar not more than six or seven feet high.

There is really only one correct style, and it requires that one place his hands not too far apart upon the pole, as will be the tendency of the beginner. That is to say, while he will necessarily have hands far enough apart to carry the pole comfortably while making his run to the take-off, he should not have them too far apart while making the vault itself. It is best to make two marks, one some fifty feet and the other some one hundred feet from the take-off, so that the run may be properly gauged. One does not need the same speed as in broad jumping, but sufficient to carry him up and over, wherefore a good run is necessary, and the higher the vault, the greater the speed.

Before starting, the vaulter measures the height of the bar with his pole, placing his right hand slightly above this point, and the left hand lower down. In making the run it is best to have the point which is to be placed in the ground a little higher than the head, so that suddenly dropping the point will help with the upward impetus of the other end. The

vaulter should leave the ground just as the pole enters it, for trying to insert the pole first will cause too much of a strain both on the man and the pole. The breaking of the pole may mean a frightful injury. The lower or left hand should be shifted upward as the pole is placed in the ground, the reason for this being that one can pull upward with far better effect when the hands are not too far apart. This pull is the important thing, so that upon approaching the bar the feet are swung up forward and raised higher than the head, the body shooting over feet foremost. The athlete lets go the bar as he goes over, throwing it back so that it does not hit the bar, also throwing his arms up so that they will not touch. The body turns during the vault so that it alights facing the bar. As soon as the right form is attained one should not practice at a moderate height, which does not require the decided up-



Photograph Pictorial News Co., New York

The pole vault.

ward pull, but should keep to such elevations as will demand the best speed in running and best efforts in vaulting. In training one should devote himself chiefly to exercises for strengthening the arms, chest and shoulders, practicing the actual vaults only two or three times a week. A vigorous development is necessary for pole vaulting.

POLO, EQUESTRIAN.—See *Horseback Riding*.

POLO, WATER.—See *Swimming*.

PUSH BALL.—Push ball is a game suitable to a large number of boys or young men, as for instance, groups of students at a great university. It has been used at the University of Pennsylvania as a substitute for the brutalities of the annual "class rush" between the freshmen and sophomores. It involves so much of the elements of pushing and crowding that it is calculated to develop some of the hardihood and other qualities required in the modified Rugby football played in America.

Push ball is not a scientific game, but it is strenuous enough and hilariously exciting from start to finish. The ball is almost a balloon, being six feet in diameter, a round rubber pneumatic bag covered with leather, not unlike a gigantic football. Being put into play in the center of the field (a regular football gridiron), the object of each side is to push it toward and over the opposite goal. The science of the game, if there is any, consists in raising the ball from the ground by the united efforts of several players, and rolling it over the heads of opposing players. In the scrimmages there is a great deal of pushing and squeezing, the type of primitive scuffle which is one of the most natural forms of play or exercise, and which is conducive to all-round development.

QUOITS.—See *Weight Throwing*.

ROPE SKIPPING.—Rope skipping is such a splendid exercise for women, and so much practiced by school girls, that it is discussed in the chapter on *Physical Training for Women*, to which the reader is referred. This does not mean, however, that rope skipping is not a valuable and suitable exercise for men, because it is of equal attractiveness and benefit for both

sexes. The over-sensitive and bashful young man need not fear that he is encroaching upon a "girl's game" when taking up rope skipping, for nearly all professional boxers do a great deal of rope skipping as an essential part of their training for endurance, speed and readiness of foot. And surely there is nothing effeminate about the professional pugilist. I would earnestly recommend rope skipping for every one, therefore.

ROLLER SKATING.—Roller skating is a most attractive form of exercise, though not of so much pronounced physical benefit as skating on the smooth and glassy ice of winter. For the most part, however, the exercise is practically the same, and the question of benefit depends largely upon the circumstances and surroundings. The great objection to roller skating in the past is similar to the chief objection to dancing, namely, that it has nearly always been carried on indoors, usually in rinks that were both crowded and poorly ventilated. Roller skating, furthermore, is conducive to the raising of great quantities of dust, not visible or in clouds, perhaps, but extensive nevertheless. When practiced in such rinks, therefore, it is not to be recommended.

Out-of-doors, however, it is a most valuable sport. When available at open-air pavilions at seaside resorts or similar places, it may be commended. For children who have good smooth pavements at their disposal the roller skate is a great blessing. Indeed, on the streets of New York City, the practice of roller skating is the one universal and almost continuous pastime. Year after year, without any cessation of interest, the roller skate has persisted upon the New York pavements, and in many quarters of the great metropolis represents almost the only diversion or exercise of the children. Children run errands and go back and forth to school on their skates.

It is quite a possibility that with perfect roads through the country, the equivalent of city pavements, the roller skate might become a national institution both for convenience in getting about and for exercise, just as it is a permanent institution among the children of New York City. Adults as

well as children may avail themselves of the advantages of roller skating out-of-doors.

ROWING.—It would be difficult to select an exercise for the summer season that is more pleasant or more beneficial than rowing. It will not only develop important groups of muscles, but it will very materially add to one's general physical vigor. One cannot perform vigorous exercise of this sort without indulging in deep breathing. To advise those who row to breathe deeply is hardly necessary, for the long sweep of the oars, the vigorous efforts demanded of the arms and back, make it absolutely essential for one to draw in full deep inspirations, which naturally expand the chest to its fullest capacity. Rowing is a splendid exercise for either sex.

Rowing provides vigorous exercise for several important sets of muscles, including the hips and legs, the arms, and most of all, the back. It is because of its special value in developing a powerful back that I would most highly recommend it, for, as I have tried to make clear elsewhere, strength of the spinal column, and of all the muscles and ligaments that surround it, has more to do with the building of vital power and nervous energy than the muscular development of any other part. Rowing is a prime open-air sport for invigorating the nervous system.

Whenever possible it is well to use the sliding seat, not only for speed but for the most satisfactory exercise. All sculls, shells and racing craft are thus provided, and the satis-



A crew from the Hammersmith Girls' Sculling Club of London

faction of moving so rapidly through the water when using a vessel of this kind adds to the attractiveness of the sport.

RUGBY.—See *Football*.

RUNNING.—[See also *Hurdling*.]—Running is a most valuable exercise for the building of health and may be recommended for this reason to those who have no special interest in the competitive phase of athletics.

Those who delight in taking long walks may often introduce a run of either a short or long distance with added pleasure and benefit, the cross-country version of running being one of the most attractive of all exercises. Short fast runs, however, commonly known as “sprints,” are very effective in building great muscular vigor and especially for the powerful development of the legs. In connection with track and field athletics, the competitive aspects of running demand attention because of the wide extent to which these games are practiced. At one time track and field meets were not held often outside of the large universities of the country, but now every high school and every grammar school has a so-called “track team” devoted to this branch of sport.

Sprinting requires a vigorous and symmetrical development of the entire body, and it will be noticed that all sprinters of championship class are very perfectly developed in all parts.



The type of “shell” built for speed and racing.

There is no greater mistake than the old-fashioned idea that only strong legs are necessary, unless it is the other antiquated notion that long legs are an advantage. If one is not vigorously developed, he should take a course of special exercise for the purpose before attempting the sprints.

Good sprinting requires that there be no lost motion. One must get a grip on the entire body, so that his locomotion is steady and in perfect control, even in the most intense effort and the greatest speed.

The novice should not go plunging, diving, stumbling forward, with head hanging downward. Nor should he go high-stepping along with head thrown far back, gazing into the celestial spaces above him. The various members of the body should not flop and fly about aimlessly, but should be kept steady, though without stiffness. The head should be held firmly. It may often help in steadying the body to thrust the chin forward a little bit out, but not up. You might try it, though if it doesn't seem to work in your case don't

do it. Never do anything that seems unnatural, even if it may be advised by athletic experts. Do not bend too far forward on the one hand, nor try to hold the body too nearly erect or perpendicular, on the other, for fear of tipping backward. Throwing the chin a bit forward, as suggested, will tend to correct any such tendency and will help to bring about the moderate forward inclination of the entire body which is most effective. In this, do not



Proper position for starting. Body should be well forward as shown in photograph.

bend the back, for this should be straight and free; the entire body should have this slight forward tendency. A run should be a falling forward from one step to another.

It is true that the chief propulsive energy in sprinting is centered in the extensor muscles of the thighs and buttocks, but any real speed depends also upon the strength, elasticity and spring-like quality of the calves. One should train for this by special exercise, if necessary spending a few minutes on it morning and evening. Arthur Duffey had a little trick which he practiced a great deal, a sort of a little dance on his toes from one foot to the other, in which, on each alternate step, he sprang well into the air with the effort of the calf alone, keeping the legs very nearly straight. It is this *springy* quality, among other things, which distinguishes the sprinter from those who are not gifted with speed.

To avoid wasted motion and the tendency to throw the heels up too far behind, the novice should concentrate his thought upon bringing his knee forward and upward with snap and energy in each stride. Try this and see what it does for your stride and style. Don't try to throw your foot forward; just think of your knee, and the foot will take care of itself. Exaggerations of style are seldom good, but it will not hurt you to exaggerate this for a while in the beginning, if it will help you to get it.

As already said, the upper body should assist greatly in the action. In saying that it should be held steady and under control, it is not meant that it should be held stiffly. There should be strength and yet freedom in the action of the upper



The cross-country runner has no need of heavy clothing in his winter sport.

body. It is usually best not to double up the arms too much, but rather to keep them nearly straight, and to keep them *pretty well down*. In other words, they should not swing up above the level of the shoulders in front, at any time. The cork grips are usually of good service, for steadiness. The arms must work naturally, back and forward rather than from side to side, and will help materially, but one can use his upper body to the best advantage if he studies the action of the shoulders and makes use of them, along with the swing of the arms. The right shoulder should be brought forward a little, simultaneously with the left foot, and the left shoulder with the right foot, and though this action should be somewhat conservative in sprinting, yet it will give one increased power and speed. In short, you will throw each alternate shoulder forward with the swing of the same arm, letting the body fall forward, as it were, to the next step.

Perhaps you will find that you have a peculiar style of your own, at which you can do best, and in that case, if you are convinced after thorough trial, then it would be better to ignore any special instruction on style, although the hints given here will apply in nearly all cases. Remember always that your action must be free. Stiffness and laboriousness should be avoided. Ease is the test of good running, and when you reach the point at which you can run easily, you will probably run well.

The start of the sprint is a most vital matter, for no sprinter can afford to get under way three or four yards behind his competitors. Among those well matched in a race, to get away slowly means to lose.

The modern crouching start is fully two or three yards faster than any standing start can possibly be. In the crouching start, one enjoys the same advantage that the panther enjoys when ready to spring. The purpose is to get away like a shot, and this one can only do *when the power is applied behind his weight*, rather than chiefly *under*, as in the standing start. The purpose should be to simply dive forward the first few strides, then gradually rise to an erect attitude.

The first starting position, therefore, is important. At the signal, "Get on your marks," you should be perfectly comfortable, with feet in their starting holes, hands on the marks, and resting on the right knee, providing you start with the left foot forward. In getting set the average novice nearly straightens the right leg, raising his back too high, and making it impossible to get any power behind his effort. The right knee should be raised only three or four inches, so that the right shin is parallel with the ground. The feet should be placed neither too near nor too far apart, it being most frequently found best to have the left foot on a level with the right knee. The hands, of course, will be placed upon the starting line. It is well if you can have your first foot only four to six inches behind the hands.

The rear leg is to be used for the push-off, and it should be completely relaxed for the purpose. Often the weight of the novice is distributed upon both legs, but the rear leg should not support any of the weight of the body. Most coaches teach that the weight should rest entirely upon the front leg, if not even partly upon the hands. But the very best plan, and the one which largely offers the secret of truly successful starting, is to throw the weight so far forward when "getting



Start of a one-hundred-yard dash.

set" that *the body rests almost entirely upon the hands*. You will find your head extending far over the line of your hands. From this position, if only you lift your hands, you will dive forward, fall forward, with great momentum. Add to this all your concentrated power in the starting spring, and you cannot help but get going fast right from the mark.

There is another most important point about getting set, namely, to avoid all stiffness and tenseness. If you get set with muscles rigid, you will find them all tied up when the starting signal comes, and it will be necessary to relax them again before you can really make the start. The arms will naturally have the effort of supporting the body, but otherwise every muscle and fiber should be absolutely relaxed while waiting for the crack of the pistol. This relaxation is imperative.

The start should be made with all possible power and energy, but do not make one big over-reaching leap at the start, followed by short steps. Simply run steadily from the start, putting your best efforts into each step.

If you have the proper fighting spirit, when you are losing a race, you will pull yourself together twenty-five yards from the finish and make the fight of your life to get there first, in spite of everything. Such an effort often wins. In your training you should occasionally practice this, running 150 yards at nearly top speed, and then making a whirlwind finish of twenty-five or fifty yards.

In sprinting it is especially important not to overtrain, and it is very easy to do so. Even a little excess in practice, or a little loss of sleep, will be sufficient to take the edge off one's speed. One should train with vigor and concentration, but only a little each day, and many enthusiasts will be surprised to find out how little work will really be best for them. It is true that all-around athletic work is best for health, development and fun in general, but if one really wishes to excel as a sprinter he should not attempt to train for other athletic branches at the same time. No one can train

for the hundred and also for the mile and be in the best form for either.

For the first couple of weeks it is well to run at moderate speed but to cover distances above that for which one is training. After that, one can settle down to real work. The following program is suggested, but may be varied, remembering that a small nervous and wiry man needs less work, and a heavy, stocky man more. For Monday, six or eight starts, sprinting twenty-five yards, and then slowing down easily. *Never try to stop up short*, but always slow down gradually, so as to avoid strain. After these starts, run sixty yards at top speed, and finally jog a very easy quarter mile. Never try to sprint when cold or stiff; always warm up thoroughly by jogging or dancing up and down on the toes.

For Tuesday, three or four starts, twenty-five yards each, and then 150 yards at top speed, followed by a little jogging. For Wednesday, six or eight starts, at twenty to forty yards, then 300 yards at three-quarter speed, or just under full sprinting speed. Thursday, same as Monday. Friday, six or eight starts, and then 100 yards trial at full speed. Saturday, same as Wednesday. Each alternate week the long trial sprint for Friday may be made 220 yards instead of 100. This may seem very little work, but in the average case it would be unwise to exceed this limit.

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Photograph Pictorial News Co., N. Y.

Gustav Ljungstrom, a record-time Marathon runner noteworthy for his adherence to physical culture methods of training. Note forward inclination of body.

Sunday one should rest, and signs of great lassitude at any time should indicate complete rest for two or three days, with lots of sleep. The more long walks and general exercise one can take, *during seasons of the year when not actively sprinting or training*, the better.

Pacing is a necessity. If your team-mate is too slow for you, give him a few yards start. Get used to running against the wind. It may be windy when you race and fighting the wind will give you strength. A rub-down both before and after the daily training, but especially after, will be of great advantage. If you have no one to do this service, you can even rub and massage your own legs with some success.

Distance and cross-country running are even more valuable than sprinting from the standpoint of health and vitality building. A few moments of violent effort can never be as valuable from a physiological standpoint as a more moderate and long-continued exercise.

It is not in the large bulk of muscle, but in the heart and lungs, in the building of stamina and strength in the very vitals of the body, that distance running works its benefits. And for this reason the cross-country game is a form of exercise which every young man should make it a point to take up at some time or other. He cannot accomplish quite the same results in any other way. The professional boxer knows it well enough, and never neglects "road work."



Alfred Shrubb, for years the world's greatest distance runner, showing ideal stride for distance work while training in severe weather. Note the swing of the shoulders.

A certain degree of moderation and self-restraint is one of the first essentials for success in running for health. Enthusiasm should be kept under control. Running is such energetic exercise that one may go "stale" almost before he knows it. For this reason it is usually best for the average youth, and especially the beginner, to do cross-country work not more than three times a week. He will improve his running much more rapidly, and will develop much more energy than by running every day. Furthermore, he should follow what should be one of the first of all rules in exercise and athletics for physical benefit, and that is *never* to carry his efforts beyond the point at which he can really enjoy them.

In the beginning he should not set a certain distance for himself in advance, and then make it a point to run that distance by sheer determination, no matter how painful it may be, or how badly exhausted the effort will leave him. It is true that this is splendid mental and moral discipline, that it develops character and strength of will, and, furthermore, that it makes one a good sportsman, but it is a mistake from the standpoint of exercise and physical benefit. Vitality is too precious to be squandered in any such way. It is so much better to commence with a moderate distance and then run a little farther each time, according to the improvement in endurance. By this plan one will be able to do five or ten miles without trouble in the course of a few weeks, and without once having undergone that utter exhaustion and distress which really consumes more of the runner's reserve vital strength than he can afford to spare.

The novice often makes the mistake of adopting extremes in style. This should be avoided. The most comfortable stride, the movement with which one can get over the ground with the least effort, is the best, even if, as in some cases, this may be flat-footed running. Never under any circumstances throw the head back, thereby assuming the prancing movement that wastes your energy and loses inches at every stride. Nor should the head hang far forward. It should be held steady, inclining slightly forward, the body likewise inclining very

slightly forward from the hips, but with back straight. Each step, then, should be an easy falling forward to the next stride. Having made sure of this, the more natural swing and rhythm you get into your gait, the better. To get this rhythm, and also to get that increased power in running which comes from using the action of the entire body instead of merely the exertion of the legs, it is a good thing to get the swing of the shoulders into it as well as the inevitable swing of the arms. Or, to be more explicit, let your right shoulder swing around forward in an easy, natural way, at the same time that your left foot goes forward, and *vice versa*. Do not make the action extreme, however.

One should not strive too hard for records the first year. In training, it is not wise to run the full distance for which you are training, at your best speed, but rather to follow a plan somewhat like that for sprinting. Both endurance and a certain speed are necessary for a one-mile run, for instance, the lung power being developed gradually by easy runs for a distance greater than a mile, while speed and strength are developed by running fast quarter and half miles on alternat-



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Intercollegiate cross-country runners running in close formation at early stage of run.

ing days. In this way you will gradually acquire the speed and the endurance for the mile without too much strain early in the period of training. The reader is referred to *Training*, discussed in the introduction to this chapter.

Those who are busily engaged in daytime can easily take their practice of evenings. But a few minutes are needed to run a mile or two, and the only thing that the novice must be careful about is not to allow his eagerness for progress to lead him into doing too much. Short stretches at an easy gait had best be taken at first, and one can increase them gradually, without, however, increasing the speed. No attempt at fast work should be made until the development warrants it. But above all, let no one, under any conditions, run until played out. It is the worst kind of training. At the earliest sign of exhaustion one should stop at once. Overwork never helped anyone in athletics, and it has harmed many. The secret of success lies in ascertaining one's limitations and not trying to go beyond them. Light work will develop more sanely and quite as rapidly.

For these evening practices there is no necessity of donning running togs. An old suit of clothes, a jersey, a cap and a pair of sneakers (rubber-soled shoes) will fill the bill nicely. Those who live in the country or in small communities will find ample facilities for training in the nearby roads and the city dwellers generally have parks at their disposal where pure, fresh air and good paths are to be had. The sight of men trotting around or through the parks of our largest cities is now a familiar one and hardly causes comment, even when they wear abbreviated costumes.

When a cross-country pack is formed, it devolves upon the leader to find out the relative ability of the men in his care and to arrange his plans accordingly. Where he discovers a wide range of speed and endurance he must remedy the difference by dividing the candidates into two or more squads, and when the time comes for the meet starting the slowest first, giving each squad sufficient handicap over the others to make them all finish as near together as possible. Also, in

those runs indulged in for pleasure, with no competition in sight, he should pick the least speedy in each squad to set the pace and oblige the others to stay behind him. If this is neglected the fear is ever present of some one over-exerting himself to keep up with the leaders and suffering a breakdown.

The choosing of convenient and attractive courses is also a duty of the leader, but does not entail any great difficulty. An afternoon's walk taken beforehand in likely localities will enable one to map out two or three, and it is advisable to seek some inn or farmhouse as the starting point, that the men may have comfortable dressing-quarters.

And speaking about clothes, it is an all-important matter, in cross-country running, to be lightly and properly clad. One must be free of movement, not hindered by heavy or close-fitting garments and comfortable as to footwear. Binding clothes will tire one in no time, heavy ones will lead to profuse sweating that is most dangerous when one is exposed to the cold breezes of winter, and ill-fitting shoes will maim the feet.

The necessary accoutrement is within the means of all. Regular spiked running shoes are of course the best, but some of the best distance men use nothing else than ordinary gymnasium "sneakers," which can be bought at a very low figure in any sporting goods store, and they are suitable for the purpose. A running shirt and light jersey should be worn on the upper body and a pair of loose knee trunks complete the outfit. The lower legs should be bare. Upon them falls the brunt of the work, and after one has gone a short distance and active circulation is started, any impression of chilliness felt at first going into the air soon passes away. The arms, however, exercise very little and should be kept covered, or they are apt to get very cold.

To the man in good physical condition and properly trained, a cross-country run at a moderate pace will prove a pleasant holiday outing. There is nothing more exhilarating, on a bright, crisp day in mid-winter, than to don running togs and start out for a good gallop through picturesque country. The keen, bracing air sends the blood rushing buoyantly

through the veins until one is bubbling over with energy and could shout for the very joy of living. It is remarkable how little the cold is felt. The body is all in a glow and one trots gladly along, drinking in great draughts of the clean life-giving ozone.

And what a wonderful tonic are these runs for the man who is confined all week between four walls and suffers from any of the hundred and one complaints to which a sedentary indoor life condemns.

Hares and Hounds. One of the strongest points that can be made in favor of "Hares and Hounds" is that it is within reach of everyone. There are in England thousands of merely mediocre runners organized into small clubs, who follow this pastime with no other thought than recreation. They love an outdoor life and they find in the weekly runs a pleasant means of enjoying themselves and of keeping in good physical condition.

The game is one of few requirements. There are no expensive costumes and paraphernalia to be bought; no troubles to be incurred in forming and developing teams; no time to be lost in seeking available grounds. The men do a little easy training by themselves, between times. They have no feeling of restraint or obligation.

One need not be a fast runner to take up and enjoy hares and hounds. Anyone with sufficient energy and enterprise to do a little preparatory work can acquire in a short period of training sufficient endurance to jog trot a few miles without inconvenience, and, of course, at first the distance to go and the pace to be held must be determined by the qualifications of each individual. Beginners will be surprised to find how quickly one improves with practice and how little effort is required if the pace is moderate.

The game of hare and hounds, as the name indicates, is a cross-country chase, of two runners representing the hares, by the rest of the men constituting the hunting pack of hounds.

The hares are sent out with a lead of a few minutes over the hounds and each carries, slung over his shoulder, a light

linen bag filled with paper cut into very small scraps. The hares choose their own course, meandering around at will and at every few steps throwing out a handful of paper scraps. Thus they lay a visible trail which the hounds take up and follow when the signal is given them to start. And it may be remarked that paper of all colors should be used for the scraps that the trail may be seen over any kind of ground.

Where wooded stretches of country are available, the leader will do well to give them the preference, both because they offer more pleasant surroundings and because when the hares are out of sight it adds zest to the chase. Still, as the trail must be followed in all cases, whether the hares are in view or not, fields and open country can be used just as well.

When the hares have traveled their allotted distance they await the coming of the pack and note the order of finishes if it is a competitive run; otherwise the hounds arrive in close formation and tracks are made for home without delay. In pleasure jaunts the finishing point had best be made near the dressing-quarters, to avoid the extra walk, but where prizes are involved this is not advisable, as it might tempt the unscrupulous to cut corners and those who play fair would suffer by it.

Marathon running is a test of strength and endurance, rather than a beneficial means of developing these qualities. Distance running for health should not exceed five or ten miles, and while a well-seasoned athlete may run a Marathon race, a distance of twenty-six miles and 385 yards, without any injury to himself, yet such a strain is not to be recommended for the average man, nor even the average athlete, as a means of improving his health. It is a grand race, and a magnificent exhibition of stamina, but since the purpose of athletics is supposed to be pleasure and benefit, one will realize these desires much better by adhering to reasonable distances.

Tag and Other Running Games. It is scarcely necessary to more than mention here the various running games popular among boys and girls, the most familiar of which are

Tag, Prisoner's Base, Follow the Leader, Pump-pump-pull-away, and others similar. It may be said that these sports are among the most valuable of all childhood games, affording just such activity as is best suited to the development of young and growing bodies. Because of the persistence of the pure play spirit in these games, rather than of the keen element of competition which sometimes forces one too far in certain forms of athletic sport, they are to be especially recommended. They will get one into that perfect physical condition which is necessary in order to enjoy and to benefit from other competitive games. While they are usually accounted as children's games, however, I wish to emphasize the fact that they are equally well suited to the needs of grown up children, and I would earnestly commend their practice at picnics, outings and all other convenient opportunities.

SHINNY.—See *Hockey*.

SHOT, PUTTING THE.—See *Weight Throwing*.

SKATING.—[See also *Ice-Hockey* and *Roller-Skating*.]—If there is one exercise which never fails to make the blood tingle, and which invariably brings a flush to the face of even the anemic performer it is skating. For the first few attempts the features may be ashen or bloodless and pinched, and the nose and ears alone may be red; but if this sport is indulged in regularly during any skating season, one may be assured that the blood will in time be brought plentifully into the entire body surface.

Not only this, but cold extremities will become tinglingly warm with the increased circulation through them. This result will not be temporary, for the exercise provides for such normal strengthening of vital organs, especially the heart and lungs, that the blood is kept circulating at warming speed, and it is decidedly more likely to be constantly oxygenated; without these conditions one can with difficulty maintain warmth of the extremities, regardless of food consumed and of clothing worn.

Those who desire an exercise which will arouse the circulation and quicken the action of heart and lungs without making too great a demand upon their sometimes limited muscular



Photograph by Underwood and Underwood.

Skating appeals to both sexes and all ages.

powers, will find in skating a pastime exactly suited to their needs. On the other hand, those who prefer an exceedingly strenuous sport, of a nature to give full scope to their maturely developed strength, will also be able to find what they are looking for in the more vigorous play of the thin steel blades upon the ice. For it is in just this respect that skating commends itself to all sorts and conditions of men and of boys, of women and girls. It can be made as easy or as energetic as the whim or the physique of the individual may dictate, and in either case will yield a pleasure all unlike that afforded by any other means. Smoothly and grace-

fully gliding over long stretches of mirror-like, frost-hardened water, with that long rhythmic swing, must be almost the next thing to flying, as far as sensations go. And the exertion for this may be of a mild or moderate character, whereas in skating for speed, the possibilities for severe and even violent endeavor, if one chooses, are unlimited. Besides, there are games that may be played on the ice, which may be made as strenuous as the players themselves desire. And there are trick and fancy skating, for the development of grace. For these reasons, and because of its excellent physiological benefits, skating answers all of the requirements of an ideal exercise.

The fact that it is an essentially out-of-door pastime is another consideration greatly in its favor, inasmuch as all open-air activities are infinitely to be preferred to those carried on

within the confines of walls and windows. For along with the importance of exercise in creating a demand for an increased supply of oxygen and promoting deep respiration, there goes the necessity for supplying pure air for such deep breathing. It is for this reason that skating is the kind of an exercise that cures a cold, relieves a headache and gives one the old-fashioned appetite that insures a robust digestion. The cold winter air adds to the sport a bracing, invigorating influence which is most valuable.

In its influence upon the heart and lungs, as well as in its general constitutional effect, skating is superb. It calls into play and strengthens not alone the muscles of the legs, but to a large extent those of the sides, back and torso generally. In short, it involves the large and important muscles which are concerned with locomotion, either in walking or running. It is apparent that even a moderate use of these large muscles will call for an increased supply of blood and of oxygen, to an extent beyond that occasioned by a far more intense contraction of some of the smaller and less important muscles. Accordingly, even in leisurely skating, the heart and lungs are aroused to the most healthful activity, while the increased circulation and the stimulation of the functional system result in great constitutional benefit.

The alternate strokes upon the ice of the right and left legs



Photograph by Underwood and Underwood.

Skating strengthens many muscles and is a superb exercise for the heart and lungs.

provide for the alternate relaxation of the muscles of each side, a great advantage, this provision for intermittent or frequent relaxation being one of the essentials of an ideal exercise.

Skating is so readily learned that it is scarcely necessary to attempt by the written word to show how it is to be done, though we would suggest briefly for the sake of beginners that they cannot expect to skate well as long as they depend upon their legs alone. They should employ the muscles of the upper body, these acting in harmony with the legs, for a great part of the mastery of skating lies in the "swing," the graceful shifting of the balance from one leg to the other. If you find your progress slow, and your efforts hard work, you will know that you are not doing it right, for skating is anything but laborious, and you will only find yourself on the right track towards the mastery of the sport when you learn to do it with ease.

SKI SLIDING AND JUMPING.—It is to Norway that we are indebted for the ski, a form of sliding and jumping snowshoe which affords some of the best and most thrilling sport of our northern winters. It is true that it requires a good provision of snow, but this is assured for a great part of the winter in Canada and the northern United States. The ski

is much used in Minnesota, Wisconsin and Michigan because of the large numbers of Scandinavians settled in those States, but the sport has also been taken up extensively by native Americans.

The ski is made of a board six to eight feet long, of the width of the foot, and with the point bent up a few inches like the runner of a sleigh. It is attached to the foot almost in the center by a couple of simple straps. For coasting the ski is



A ski-jumper making a long and successful leap.

more thrilling than the sled, because one stands up and maintains his balance even while going down hillsides which are nearly as steep as a cliff. The runners or skis are more readily kept in their necessarily parallel position than might be supposed, though it takes practice to become expert. Falls are numerous, but there is always a bed of snow which almost makes falling attractive.

But the big sporting interest of the ski lies in the jump. The small boy coasting knows what it is to go over a "bump," and it is just this, on a large scale that the ski-runner enjoys, carefully building banks off which to leap at full speed, like jumping off a precipice. This "take-off" is located not far from the foot of the slide so that it is reached at full momentum, and usually has a slight upward incline upon its approach, thus tending to shoot the jumper up in the air. Ski tournaments are held annually in the States of the middle West, at which the first-class jumpers in striving for records make startling leaps varying from one hundred to almost one hundred and fifty feet.

SNOWSHOEING.—The man must indeed be lacking in warm red blood who does not feel the call of the great open air when winter spreads its beautiful white mantle over the earth and keen breezes sweep down from the north.

But the country is frequently impassable to the pedestrian by ordinary means, when snow lies thick on the ground. Mother Necessity, however, came to the rescue in the dim past by suggesting to the inhabitants of cold climates an ingenious racket-like device with which even the deepest drifts could be negotiated with safety and ease, and thus the snowshoe was born.

For those who may not be acquainted with this useful invention of the Indians it may be well to say at the start that the snowshoe is a type of footgear consisting of a wooden frame of elliptical form, more or less rounded in front and running back into a point at the heel. Two or three battens mortised into this frame stretch across it, and the entire inner surface is filled with a network of hide, leaving only a

small opening forward of the center to give play to the toe of the foot in walking. Resting upon this webbed support the foot cannot sink very deep even where the snow is lightest and the wearer is enabled to cover the ground with speed and comfort.

In selecting snowshoes there should be taken into consideration the amount of work they will be submitted to and the kind of territory in which they are to be used. Different types are required for different localities.

Those about to visit the far north, where the dry and extreme cold keeps the snow loose and flaky, should choose a large and finely knitted shoe that it may have plenty of supporting surface, without obliging one to lift at every step the

clumps of snow that attach and cling to a heavy weave. On the other hand, in more southerly regions, where the dampness of the air causes the wet snow to pack and often to crust hard, a smaller shoe can be used, but heavier filling is advisable.

Of course the conformation of the country to be visited must also influence the choice. One intending to hunt in the woods, for instance, will have to



Photograph by Keystone View Co.

Long walks on snowshoes are much favored by the young people of Canada and other regions where there is much snow in winter.

select a different model from the man who expects to find only open and flat ground, and a shoe totally different from both must be picked for hilly or mountainous country. A snowshoe having a long toe or a far-trailing heel is not only dangerous but quite unfit for traveling up and down hill.

In mountain climbing a short, compact shoe is necessary and the bear-paw type gives excellent service.

In taking up snowshoeing it is most unwise to venture out on a trip of any kind before having had plenty of practice near home. To walk on snowshoes looks easy enough, as do most difficult feats—when performed by an expert. As a matter of fact considerable skill is needed to navigate properly on them and the action is so totally unlike that of ordinary walking that many a pitfall is open to the over-confident.

Particular attention should be given to walking with feet straight in front and wide apart, and to lifting the knees well in pushing the shoes forward. The width of the rackets, requiring a space of anywhere from twelve to sixteen or eighteen inches between the feet to prevent interfering, makes the going awkward and uncertain until one has become used to it. The man who fails to allow the necessary play will likely be treated to some nasty falls. Likewise, if the knee is not raised enough the toe will catch in the snow and throw one forward to a heavy cropper. The novice is very liable to stumble this way, because in observing experts the idea is formed that the motion is a gliding one, this idea being given by the trailing heel of the snowshoe and the heavy side-to-side lurch of the body as the snowshoer rests his weight first on one, then on the other shoe. But the motion is far from a gliding one. Rather is it to be compared with the action of a high-stepping horse.

The heel rises from the snowshoe at every step and the toe bends over the toe-hole in the shoe, allowing the racket to swing as on a swivel. And the novice needs to be cautioned against allowing the foot to protrude too far over the toe-hole. Carelessness in this respect has caused serious trouble even to old timers.

However, snowshoes made for the market cannot always be relied upon. Not that this statement should be taken as a general condemnation of trade shoes, for there are firms whose integrity is beyond question and who use only expert workmanship and the best material. One does at times meet with shoes of inferior quality, however, and it is just as well to caution the unwary. Particularly should those be careful in selecting their snowshoes who are about to trust themselves in far away, unfrequented places, to these ships of the northern wastes. One is apt to find among store-made shoes defective frames that will break or wear-out and fillings of beef hide that will stretch and sag dangerously after a wetting. A hopelessly broken shoe may come to be a matter of life and death, under certain conditions, and it is a sensible plan to minimize the chances of mishap by taking the trouble to obtain a first-class pair of shoes hand made by one who builds only a limited number and gives each pair utmost care in every detail.

SOCCER.—See *Football*.

SWIMMING.—Swimming is one of the most attractive of all summer sports because it combines the delights of bathing with the pleasures and benefits of a most satisfactory and perfect form of exercise. Practically all parts of the body are employed in the various swimming strokes, and not only this, but the use of the various members of the body is such that it requires the full and complete use of the muscles which has been pointed out elsewhere as an essential of ideal exercise. Swimming involves the full sweep of the limbs and also vigorous activity upon the part of the muscles of the torso. It is an exercise well calculated to develop symmetry and a uniform strength throughout all parts of the body.

It is in the power of anyone to master unaided, and in a very short time, the principles of natation sufficiently to meet ordinary requirements, but it would be a poor kindness to the prospective swimmer not to add that a high degree of proficiency—according to present day standards—cannot be attained without the aid of competent in-



Photograph 1.



Photograph 2.



Photograph 3.



Photograph 4.

Photographs 3 and 4 illustrate method of performing leg and arm movements combined, while in standing position. As the arms are swept outward and backward from first position, the leg is extended outward and downward. Both legs may also be used with arm stroke.

Photographs 1 and 2 illustrate the first and final positions of the breast stroke in swimming. This stroke may be practiced while in a standing position, as here illustrated, without making use of leg stroke. After arm movement has been mastered, it may be practiced in conjunction with leg stroke, as shown in Photographs 3 and 4.

struction, or at least the constant example of expert talent. This candid statement is not made with any intention of discouraging the beginner, but for the purpose of impressing on those having the facilities to place themselves in the hands of good teachers, the wisdom of doing so without loss of time. It is by far the shortest and most satisfactory road to success.

Experience has proved beyond a doubt that the most modern of the so-called speed strokes—the trudgeon and the crawl—are not only the best for all-round swimming, but also for developing harmoniously and symmetrically every set of muscles in the body. And why shouldn't they? They are the result of long years of studying the application of scientific principles to the art of obtaining the greatest amount of speed and endurance out of the forces at our disposal, and they have solved pretty thoroughly the problem of comfort and efficiency.

These strokes are not natural ones, however, and they are rather complicated, so that it is almost out of the question to acquire them properly without the help of a coach, and in undertaking to unfold a system by which the uninitiated can learn unassisted and quickly how to handle themselves in the water the prudence of advocating the more simple and easily mastered breast stroke becomes evident.

In the writer's opinion—and I hold this opinion in conjunction with many of the best instructors in the country—the quickest way to learn how to swim is to acquire perfect control of the correct movements of the stroke on dry land before entering the water at all, and to prepare one's self also by mental suggestion. The movements essential in swimming can be practiced on land before venturing into the water. It is an unquestionable, and universally recognized fact, that we can school ourselves into doing things almost automatically. We see cases of it on all sides, in everyday life. And there is little doubt that by picturing to one's self the actual going through of the swimming movements in the water, while practicing them on land, one can train the mind to suggest them to the body when the time



Styles of diving and various swimming strokes.

comes. The muscles will then respond, and as performing the movements even approximately cannot fail to sustain one, the first period of development will thus be cleared at a leap, or at least greatly shortened, and confidence—the most important factor in learning how to swim—will be acquired in a much shorter time.

One of the best features of the land exercises is that they enable one to indulge in preparatory practice almost anywhere; in a gymnasium, in the open air, even in the privacy of one's bedroom. And they also allow the calm and collected study of perfect form, frequently made impossible in the water, by that unaccountable dread of the "treacherous element," that so many of us experience and that seems to paralyze our thinking qualities.

There are three distinct phases to the breast stroke: arm movements, leg drive and respiration. It is advisable to at first practice them separately on land, while in a standing position, at first, and to master each completely before passing on to the next, not attempting to run them in together until all three have become thoroughly familiar.

While the proper way to practice these individual parts would be to lie flat, face down, on some available support like a narrow couch or bed, a padded chair, a canvas stool, etc., and so get used to the position that the body must assume later in the water, this system has the disadvantage of being decidedly uncomfortable and fatiguing. It is therefore preferable to stand up while acquiring the dissected parts, and only to do horizontal work when ready to try the complete stroke.

In practicing the arm action one stands erect with hands held at the height of the chest, palms down and fingers and thumb close together, pointing in front (see Photograph 1, of standing exercise). Push hands forward with a rather slow, continuous motion, until fully outstretched, as in Photograph 1. Turn hands back to back, and with a determined, forceful sweep make them describe a semi-circle, parallel to the ground, until extended at your sides at right angles to the

body, Photograph No. 2. Lower elbows and gradually turning the hands palm down return them to starting position. Continue these movements until they come naturally, having care to push the hands forward quite slowly (for in going to the full reach they are opposing the water and the slower they go the least resistance they will offer), and to bring them back with some force, as the more power you give them the greater forward impetus they will impart to the body.

The leg drive of the breast stroke is known as the "frog kick," and its name is quite descriptive. Without changing your erect position, Photograph No. 1 (toes pointing forward, legs and feet close together), alternate with the right and left the following movements: Lift leg from the ground by moving knee up and out, keeping foot close to other leg until the heel is at the height of the other knee, Photograph No. 3; then push foot out sideways until leg is straight. Bring down sharply to starting position. In practicing on a support, both legs may be used at the same time, but the action is identical.

Before describing the method of breathing used in swimming—it is timed to suit the different strokes—one feels the



Manner of sustaining the prospective swimmer when the beginner has the advantage of an assistant.

advisability of laying particular stress on the absolute necessity of inhaling and exhaling correctly if ease and form are to be obtained. Both the comfort of the swimmer and the smoothness of his stroke depend so much on proper breathing that proficiency cannot possibly be attained with a defective system.

Air should be taken in through the mouth as

the arms are pulling (taking their stroke from the full reach to the finish of their orbit), because the application of their power lifts the shoulders high on the water and brings the mouth well above the surface. Breath should be exhaled through the nostrils while the arms go forward from the chest to the full reach. Both intake and output must be easy and gradual, not anxious, or hurried. In filling the lungs take the entire time at your disposal and the same in emptying, that there may be no time when you are uncomfortable for lack of air or through having too much.

Of course the principal aim in practicing breathing should be its timing. Just try to keep before you the fact that when the arms are pulling, the mouth is above water, while when they are recovering (going forward), it is under, so that to breathe on the recovery is to inhale water instead of air, which causes coughing, choking, and possible asphyxiation. An easy way in which people can remember when to inhale and when to exhale is for them to imagine themselves blowing their hands away from them and then inhaling as the arms open. In practicing breathing on shore in standing position the head should be tilted back slightly, as it is so carried in the water.

When the time comes for running the component parts of the stroke together, it becomes necessary to take the position advocated above, stretched out face down upon some support, with arms and legs free that they may be used without inconvenience. Remember to hold the body straight, with head a little raised, arms out to full reach before you parallel to each other and to the floor, hands flat, palms down; legs straight and close together, feet pointing down as when standing on tiptoe.

Lead out with the arms. Turn hands back to back and proceed to describe the semi-circle that you have been practicing. The only difference lies in the slightly higher position of the arms, but this in no way alters the movements. Begin to inhale as soon as the hands start to turn and continue with slow, steady intake until the arms are ready to start forward.

The legs are not moved at all until the elbows have been bent and the hands are close to the chest; then they are brought up without haste; as the hands are pushed away from the body, you begin to exhale with the same quiet, even blow, and at the same time straighten the legs; when the hands have attained the full reach you stop exhaling and snap the legs briskly together.

A number of old-fashioned instructors still teach the use of arms and legs together, but their method is totally and fundamentally wrong. And this is why: In opening and bringing up the legs an immediate check is placed on the forward impulse and there is actually a drawing back of the body, just as there is in shooting the hands forward. In using the arms and legs together it so happens that the leg recovery offsets the benefit derived from the arms, and the arm recovery kills the impetus given by the kick. By completing the arm stroke while the legs are trailing and not offering any resistance to the water, so much speed is imparted to the body that the preparation for the kick cannot altogether stop it, and the check has hardly become effective when the leg drive starts the body forward again and the position is then such (flat, with arms and legs straight and offering the least possible resistance to the water) that the form of inertia keeps one going for some time. This sliding without motion after the power has been applied constitutes the "run" which one often hears talked about by speed swimmers.

Now, the reader may say that he or she does not care to go fast and that the old way seems easiest. Bad view to take of it, for it is just as simple to learn correctly as incorrectly, and speed makes all the difference in the world in swimming, particularly to the beginner. The fact should never be lost sight of that in the position one assumes for swimming the breast stroke the body follows the principles embodied in the hydroplane boat. Speed has the tendency to lift it above the surface and the faster it moves the less becomes the submerged portion. Therefore speed must be considered an important factor in sustaining the swimmer.



Some of Annette Kellerman's feats of diving and swimming, showing the splendid development she has acquired through proper exercise.

When the time comes for you to enter the water, a point to be decided is whether someone can be found to aid you in your first attempts, or whether you must make them alone. Your helpmate need not know a thing about swimming; all you want him for is to support you.

If you have to go it alone, choose if possible a place where the water is shallow, but not too shallow—say, up to your chest. This, that you may be able to swim without your feet touching bottom, yet have the feeling of security that an assured footing gives one. If you can find an assistant, get used at once to deep water.

The use of sustaining appliances can sometimes be recommended, for in some cases, particularly if one be of a nervous disposition, or inclined to fear the water, they help to inspire confidence and, of course, they are indispensable if one has to learn alone and only deep water is available.

Of the various floating devices now in existence the air-inflated ones are most satisfactory both because they can be adjusted so as not to interfere in the least with one's movements, and because the air can be gradually let out, so that one passes in almost unconscious stages from an overabundance of support to none at all. The word overabundance is here used intentionally to emphasize the fact that no artificial support of any kind is needed to keep one afloat.

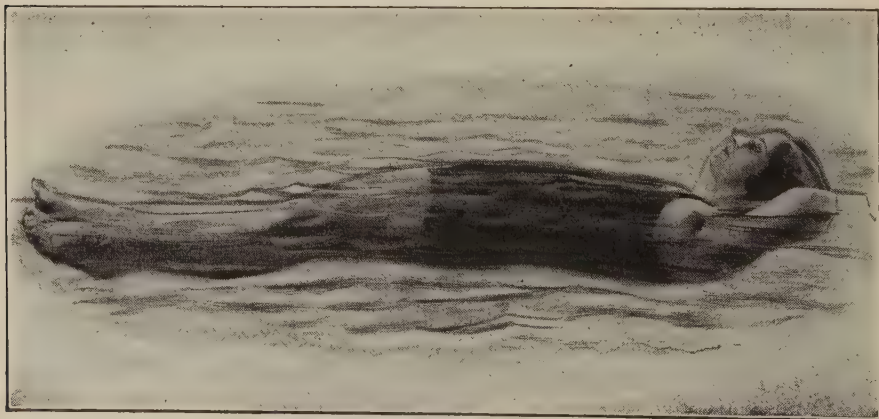


One position employed in using the breast stroke.

The body floats naturally, whether supine or face down, and if the nostrils and mouth were to be sealed it could not possibly sink, for the lungs act as an air chamber and make its weight lighter than the amount of water it displaces. People would never drown could they manage to keep the lungs free of water. The trouble lies in their not knowing enough to hold their mouths above water. In their frantic efforts to save themselves they inhale water instead of air, the lungs fill, and the buoyant center being destroyed the body sinks.

The aid of both floating devices and a companion is moral as much as physical, yet none the less necessary.

When you have someone to assist you make a belt for yourself, (a strip of canvas, a leather belt, or even a bit of rope will do,) which you must wear around the body, a few inches above the waist line; to this you attach a piece of light cord, the other end of which is made fast to a thin pole. Your assistant holds this pole, and as you let yourself into the water he applies sufficient power to sustain you on the surface, head well above water. You then proceed to go through the movements you have been practicing on land, slowly and deliberately, while he measures his support according to your wants. Of course you have chosen for your lessons either a dock, float, or other place, where your human life belt can walk up and down with you as you swim. He gradually re-



One position assumed in floating.

laxes his lift until you swim unaided, which, if you have prepared properly, should be very soon indeed.

Keep in mind at this stage of the game, that to hasten the movements will not only exhaust you, but will also make it impossible for you to go through them correctly.

In learning alone in shallow water allow yourself to drop slowly from a standing to a swimming position and try to lie comfortably with feet a little below the surface and mouth submerged. The water line should come between the mouth and the nose. The muscles should be relaxed and no part of the body rigid or strained.

One of the most prevalent faults among beginners is to believe that correctness of form lies in stiffness of muscle. This is particularly wrong in the case of swimmers, because relaxed muscles will adjust themselves almost naturally to the proper position. There is no need, for instance, to crane the neck in order to keep the mouth above water, it only tires without helping, and it destroys the balance of the body. The arms will lift you while they apply their power and you can then breathe freely without raising the head at all.

Having assumed the proper position, go slowly through the movements until you feel yourself sinking, then just put down your feet, stand up and try again. But don't hurry, let me repeat it again that you may remember it. Take only three or four strokes, at first; take only one if you find yourself unable to do more without sinking, but make that one a correct and a deliberate one. You can afterward increase one by one if you can do no better.

Never tire yourself, in the beginning; stop and rest as soon as you begin to feel fatigued. You will improve more readily. And realize from the start that when you are able to go through thirty or forty slow strokes, without resting, you know how to swim. After that it is merely a case of practice and development.

In regard to both the healthfulness and the danger of swimming, a distinction must be made between the exercise itself, and the action of the water. A comparatively long

immersion, especially in cold water, may prove harmful, where the exercise alone would not have been excessive. In cold or cool weather the warming-up will occur much more promptly if a rubber cap is worn. Adjusted with a strong rubber band; this keeps the hair dry, and in no way interferes with freedom of movement. A tight-fitting swimming suit of warm material will be found to preserve the bodily heat better than a pair of trunks. The advice to leave the water before a feeling of cold is experienced, is as trite as that to the effect of leaving the table while still hungry, and is about as likely to be followed. Certainly, however, common sense should tell us to leave the water *after* the chilly feeling comes on, and not to wait till a fit of shivering proclaims a still greater distress of the body. Beginners are more likely to suffer in this respect than are advanced swimmers, since they are obliged to take frequent rests while in the water, whereas the experienced swimmer can keep moving.

Tank swimming may to the uninitiated appear as a milder form of the sport, but in reality it is not so. The small body of water becomes more quickly and more irregularly agitated than a larger open-air surface, and the increased liability of running into someone does not conduce to ease of movement. The "turns" that can be made at the end of a tank seem at first to give a slight rest to the swimmer, but when continued they are really a more vigorous exercise than swimming itself. To the beginner the turn is a valuable illustration of how the swimming kick should be made, for if there is one point above all others in which the learner fails, it lies in not presenting the soles of the feet and the palms of the hands squarely to the water. The football kick is the one which should *not* be used.

Water Polo. Water polo is an adaptation of the game of polo to the water, being a sport much enjoyed by those who are expert in both swimming and diving. One who cannot swim rapidly and continuously will naturally be unfitted for it. It is played with an inflated ball, and may be said to be as much like basket ball adapted to the water, as like polo,

except that the basket ball goals are not used. The opposing teams endeavor by hitting and throwing the ball to force it through their opponent's goal as in other games, and it frequently happens that diving is necessary to elude an opponent, or sometimes, to push another under the water to interfere with his prospective play. Strenuous and vigorous in the extreme is this water game, and admirable for purposes of physical development, inasmuch as the different forms of swimming employ all of the muscles of the body. Water polo is to swimming what hockey is to skating on the ice.

What to do for the Drowned. The following useful and practical directions for reviving the partly drowned have been issued in the form of a placard by the Michigan State Department of Health. The drawings which illustrate the instructions are reproduced from originals made by the Journal of the American Medical Association.

Rule 1.—Lose no time in recovering the body from the water. Always try to restore life; for while ten minutes under water is usually the limit, still persons have been resuscitated after being under water for thirty or forty minutes. Do not lose time by taking body to a place of shelter—*operate immediately.*

Rule 2.—Quickly lay the person prone, face downward, with stomach resting on a barrel or roll of clothing, so the head will be lower than rest of the body and water will run out from the throat and lungs. Wipe dry mouth and nostrils. Wrap the corner of a handkerchief about the forefinger and



First position.



Second position.

clear the mouth of all mucous and slimy substance back as far as the top of the throat. Rip open the clothing on chest and back and keep face exposed to air. Separate jaws and keep them apart with a cork, stone or knot in a handkerchief. (See First Position.)

RULE 3.—Remove the roll of clothing from underneath the stomach of the patient. Kneel by the side of or across patient. Place your hands over the lowest ribs. Lean forward and put your weight straight over the lowest ribs. *Exert this pressure for three seconds.* To count three seconds, say: "One thousand and one, one thousand and two, one thousand and three." (See Second Position.)

Rule 4.—Do not remove the hands from the ribs; but *release the pressure from the ribs for two seconds*, by squatting backward. To count two seconds, say: "One thousand and one, one thousand and two." (See Third Position.)

RULE 5.—Again exert pressure straight over the lowest ribs for three seconds, and as described in Rule 3; then again release pressure for two seconds, as described in Rule 4. Alternate thus (three seconds pressure and two seconds release) about twelve times a minute, until breathing is restored. This method of resuscitation at once expels water and produces the identical results of normal breathing.

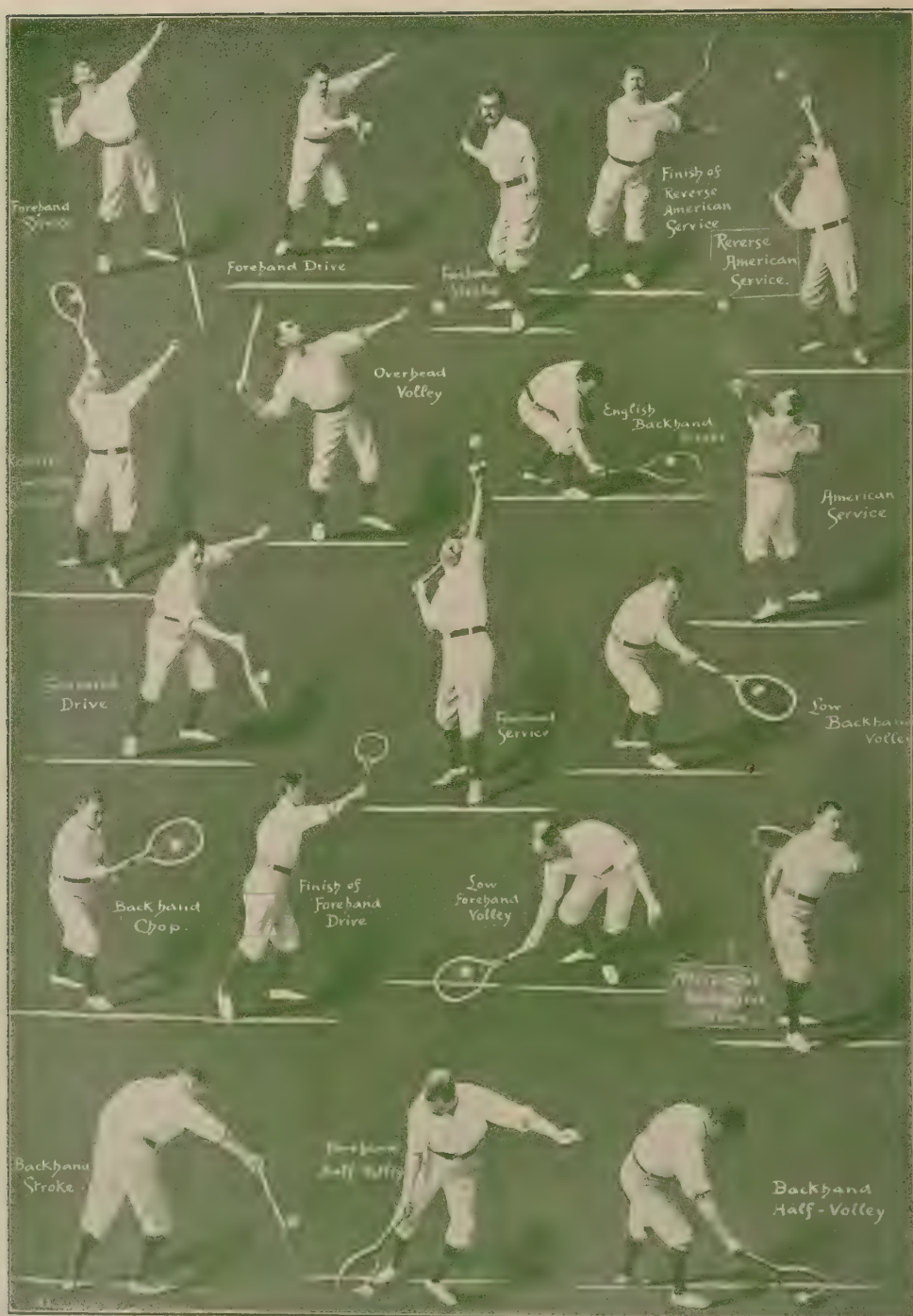
This method is what is known as the Schafer method of Artificial Respiration, and has been adopted by the Royal Life Saving Society.

Rule 6.—If another person is at hand to assist, let him do everything possible to keep the body warm, by sheltering it from the wind, rubbing hands and soles of feet, making hot applications.

Camphor or ammonia may be applied to nostrils to excite breathing. Warm the head nearly as fast as other parts of the body.



Third position.



An illustrated lesson in tennis-playing, showing methods of handling the ball in various positions.

Rule 7.—After breathing is restored, remove the patient to a warm bed where there is free circulation of fresh air. Administer in *small doses* stimulants, (hot coffee, ginger tea, hot sling,) being careful not to let the patient choke or strangle. There is danger that the patient may suffer congestion of the lungs and have great difficulty in breathing. When this occurs, a large mustard plaster should be placed over the lungs.

To keep from drowning, it is advisable, but not necessary, to know how to swim. One finger placed upon a piece of board, an oar, a paddle, will easily keep the head above water. Breathe, and keep a cool head, and you will be able to keep your head above water until help comes.

The above instructions may be modified or improved by substituting hot wet packs for the mustard plaster, and hot water, hot lemonade or hot diluted grapejuice.

TAG.—See *Running*.

TENNIS.—Lawn tennis is an ideal outdoor game for both sexes. It has the advantage of being of such a nature that the players can make it as fast and active as they may choose. It develops speed, a clear eye, accuracy, suppleness and grace, together with a normal and vigorous degree of strength in all parts of the body. If anyone unacquainted with tennis fancies that it is a ladies' game, he need only practice it long enough to acquire the skill necessary for a fast game, and he will find it as strenuous as he desires.

Tennis is played on a court 78 feet in length and 27 feet in width (for singles), and 36 feet in width (for doubles). Singles means playing with one person on each side, whereas a game of doubles includes four persons, a team of two partners on each side. A light, elastic ball two and a half inches in diameter, and a racket made of a sort of oval wooden frame, about eight inches wide and twelve inches long, with the open space strung with a network of catgut, and with a handle of about fifteen inches in length, constitute the implements. The ball is played over a net stretched across the center of the court and answering the purpose of a fence. The ball must

be played over the net and within clearly marked limits of the court, failure in this meaning points for the other side.

Never hold the handle loosely, and always grasp it at the extreme end. No other bad habit interferes with successful playing more than holding the handle in a loose, unsteady manner. Grasp it firmly, otherwise your efforts will be useless. Playing against a blank wall furnishes excellent practice when an actual contest is impracticable.

To baffle one's opponent calls for much shrewdness and skill, and a good player most thoroughly enjoys the game, when pitted against an opponent of equal or greater skill. A game easily won is not so intensely interesting, and one may weary of the lifeless play, but when it is necessary to constantly watch the ball and to always be on the alert, then game after game can be played with the interest continually increasing. When competing against a skilled player one develops speed most rapidly.

Much endurance is gained through the playing of tennis. So much running about is necessary, so rapid and constant are the movements, and so sustained the mental efforts involved that tennis becomes an exhausting game. The heart action incurred by the exercise is necessarily vigorous, and the increased muscular activity calls for more rapid respiration.

The fact that tennis is primarily an outdoor game is a great advantage in itself. This not only enables the players themselves to secure an abundance of oxygen, but any spectators are also benefited by the fresh air and ideal surroundings.

A free and easy costume should be worn on the tennis court. Ordinary footgear should be replaced by tennis shoes, and no hat, no high collar, no cuffs and none of the similar accessories to the conventional attire should be worn. The true lover of the great outdoors expects and wants to show the result of an active, energetic life. A good healthy color is much preferred by the modern woman to the delicate, white, chalky appearance of her more "gentle" sister. The free and

easy costume of the tennis court is a grateful relief from conventionality to the sensible woman.

TOBOGGANING.—*See Coasting.*

TRACK AND FIELD ATHLETICS.—This is the designation given to a certain class of sports practiced on the running track and usually also upon the field enclosed by the circular running track commonly provided on athletic grounds. Under the head of "Track and Field Athletics" are included running races, for short and long distances, hurdle races, jumping for both height and distance, pole vaulting and several forms of weight throwing, including thereby a variety of exercises calling for speed, endurance and great strength. These various forms of competitive exercises are here taken up separately. In connection with these the reader is also referred to *Training* in the introduction of the chapter.

TUG-OF-WAR.—Tug-of-war is a grand game for those who are strong and in a physical condition to exert themselves to the limit of their strength. For those who are frail or imperfectly developed, it is too vigorous and violent. Yet, if they can stand a moderate measure of the strain of a tug-of-war, this strenuous exercise will go far to making them as tough as leather and as hard as a powerful, athletic man may be. In its very nature it means that every man on each team shall exert himself to the utmost limit of his strength, and that for intervals sufficiently long to try him out thoroughly. For those interested, I might suggest that special training for lung power and endurance will be of special value. With superior endurance, one team will always defeat another of equal weight and similar strength that lacks the enduring power. The first half-minute will not reveal the difference in physical condition, but after that the benefits of proper diet and sustaining lung power will assert themselves.

The heavier the rope used, the better. To judge a contest it is well to tie a white handkerchief in a knot upon the middle of the rope, this being exactly over a certain mark. When both sides are ready, a signal is given and the tug is on. When

the knotted handkerchief shall have been pulled a special distance agreed upon, one, two or three feet, to either side of the mark, the bout is won. The bouts may be timed, so that they may be awarded to the team having the advantage at its expiration. One or two minutes is usually enough for a bout, and a contest usually consists of three bouts, the best two out of three winning. Usually there are six men to a team, but for purposes of exercise or practice there need not be more than two or three to a side. If played indoors on boards, cleats of wood should be provided crosswise, to brace the feet against. Even outdoors, the tug-of-war may best be contested on a course of planks provided with such cleats.

VAULTING.—See *Jumping* and *Pole Vaulting*.

WEIGHT THROWING.—Weight throwing offers a form of exercise very different from the other track and field sports, and one which is very valuable for the development of rugged strength.

Putting the shot is much like throwing a cannon ball, though the “put” is not an overhand throw, but a straight push out from the shoulder. Sixteen pounds is the standard weight, though high-school boys often use a twelve-pound shot, and still younger boys sometimes an eight pounder. The shot is “put” from a seven foot circle. If one steps outside of this, it is a foul and the effort does not count.

The purpose of the athlete should be to acquire such form that his legs and body may help him to express all possible power in putting the shot. It is not done with the arm alone, as it may look to be. In putting the shot with the right hand, the athlete should bend far back and down to the right side, then, drawing the left leg back and instantly throwing it forward again, a little hop is executed which brings the athlete to the other side of the circle, in the same position of the upper body, but with both knees bent, especially the right. Now, continuing the impetus gained through this hop, the put is made with all possible force, from the legs up, not only thrusting the shot out with the arm, but raising and bringing the right shoulder around with it so that as it leaves the hand the

body has turned half way around, and the left and right feet having changed positions. To get this hitch it is well to practice this little jump, turning half around so that the right foot alights where the left foot has been, also thrusting out the right arm. All methods of developing strength are of value in training for the shot-put.

Throwing the discus is a revival of the ancient and classic sport of the Greeks. The discus is a four-pound disc, made of wood, brass and steel, eight inches in diameter, a half inch thick at the edges and two inches thick in the center. It is like two plates placed together, convex sides outward, and in throwing the object is to make it sail through the air as far as possible. It is thrown with a full sweep of the arm. The fingers are spread out over it, the last joints of fingers and thumb hooking over the edge, and it is held palm down, retaining its position in the hand through centrifugal force during the swing on the throw. The athlete starts by bringing the arm down and far back, preparatory to throwing it in the direction toward which his back is turned, thereby giving it a sweep of 270 degrees or three-quarters of a circle. It may be thrown in this way, and without a turn, as was the custom of the Greeks, but discus throwers of the present time make a complete turn around of the body to give greater impetus. After learning to throw it as well as may be without this turn, the athlete can then profit by adding this feature. To make this turn, the athlete starts out as though to throw it, but when the arm gets well around he executes a complete turn of the body, feet alighting facing the same direction, and with the arm following around with increasing momentum.

It is a splendid exercise for the chest muscles, but for the best results should be practiced with both left and right hand.

Throwing the hammer is probably the most interesting of the weight throwing events, but care should be taken that spectators are not too close. The standard weight is 16 pounds, though a 12-pound hammer is used by school boys and those not heavy enough for the heavier size. A flexible steel wire handle is used, with a double loop for the grip so that one

may take hold with both hands, the length, over all, being four feet. Like the shot and discus, it is thrown from a seven-foot circle. Thrower stands with his back to the direction in which it is intended to throw it.

The simple throw, without turns, should be mastered first. With hammer on ground to the right, swing it around in front to the left, back over the head and around, swinging it around the head with increasing momentum three times, toward the ground in front, and high back of the head, finally, with a smart backward pull, letting it fly straight backward. After getting this form perfect, learn to throw with one turn. First swing as before, twice around the head, and as the hammer swings back behind you for the third time, turn around once quickly, facing the same direction as before, and conforming to the momentum of the hammer. If it is done right, the pull

of the hammer will help you to make the turn; you should then give a pull upon the hammer in turn, increasing its momentum, and with a final backward tug, let it go flying. Having mastered the secret of the one turn, and working in harmony with the momentum of the hammer, you can soon acquire two or three turns and enjoy the satisfaction of seeing the weight fly far up and away.

Throwing the 56-lb. weight is similar in execution to the throwing of the hammer, except that it is done with a very short handle and requires great strength rather than the combination of strength and



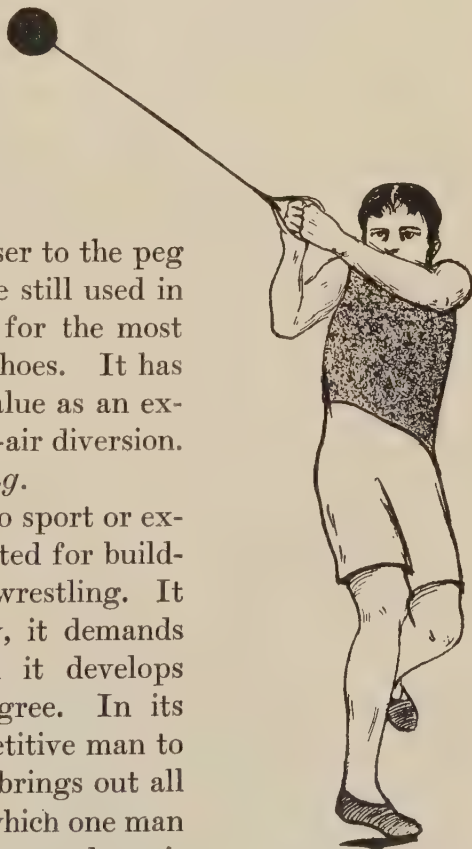
Throwing hammer—Position at the start of the throw, hammer to the right.

speed necessary for throwing the hammer. It is suited to heavyweights only, but the same exercise, with a thirty-five pound weight, would be admirable for building strength in the case of lighter men. Starting from the right side, the weight is swung just once around the head and then just one turn is made, whereupon the ponderous missile is hurled backward. Throwing the 56-pound weight for height is sometimes included in athletic games, but it is not much practiced.

Quoits. Quoits is a modest old game for outdoor play, but one which still holds a peculiar interest to all those who have played it enough to get acquainted. The original form of the game employed rings, to be thrown from one stake to another, points depending upon throwing the ring over the peg or upon getting one's rings closer to the peg than opponent's. Rings are still used in the game, in this way, but for the most part it is played with horseshoes. It has no special or remarkable value as an exercise, but is a pleasant open-air diversion.

WHEELING.—See *Cycling*.

WRESTLING.—There is no sport or exercise in the world better suited for building vigorous manhood than wrestling. It calls for speed and activity, it demands the utmost endurance and it develops strength in the highest degree. In its very nature, that of a competitive man to man struggle, it necessarily brings out all of the physical qualities by which one man might expect to subdue another under primeval conditions. In a way, it takes one out of the stilted, artificial, civilized life of to-day, back to the original natural conditions



Immediately after the turn, showing advantageous position for a hard pull before the next turn or the throw.

of life in which primitive man grew strong through grappling bodily with his foes. Wrestling is the play form of the world-old hand to hand struggle which in the beginning usually meant life or death, instead of merely forcing an antagonist helplessly upon his back.

There are several forms of wrestling more or less practiced at the present time, but of all these the "Catch-as-catch-can" style, known also as the Lancashire style, is the best and most universally employed. Elsewhere the reader will find a description, with illustration, of so-called "hand wrestling," but though it is a splendid exercise, it is not a true form of wrestling. The Catch-as-catch-can style, which we are illustrating here, permits of the greatest variety of holds, including practically every part of the body, and requires that two shoulders touch the mat at the same time to constitute a fall. The Græco-Roman style is similar in most respects to the Catch-as-catch-can, except that wrestlers are not allowed to take hold below the waist line. It is naturally popular with those who find themselves best suited to this style.

The Cornwall and Devonshire style, often spoken of as "Cornish wrestling," requires the wearing of a loose jacket by which contestants can catch hold of each other. No holds below the waist are allowed, and a collar hold is a favorite. A fall requires "three points down," meaning that two shoulders and one hip, or two hips and one shoulder must touch the ground simultaneously. The men wrestle on their feet, and it is necessary to throw antagonist on his back before feet, arms or any other part of the body of either touches the ground.



Throwing the discus.
The first position, ready
for a powerful sweep of
the arm.

In the Cumberland and Westmoreland style, the wrestlers stand chest to chest, chins on each other's shoulders, and grasping the body, each with left

arm above the other's right. When ready, the bout begins, and requires merely that one be thrown off his feet, even on one knee, or that his hold be broken loose.

The Collar and Elbow style was at one time quite popular. Its name indicates the form of hold required, and the requirements for a fall are practically the same as in Cornish wrestling. So-called Sidehold Wrestling does not amount to much, for it is limited to the hold indicated in its name. It is a kind of school-boy style, giving the advantage for a hip-lock or cross-buttock fall, to the one having the under hold. The hip-lock is useful in any form of wrestling, consisting of getting the hip in front of opponent as far as possible, bending forward, thus raising him off his feet, and then quickly throwing him on his back. The Cross Buttock is much the same except that it is done with opponent in a backward position, getting your hip under his hip or back instead of in front of his body. One cannot catch an experienced wrestler in this way, however.

In all these styles, foul tactics are barred. The referee has power to disqualify and award a bout against a wrestler who butts with his head, scratches, or otherwise seeks to hurt his opponent.

Though wrestling is a magnificent game for developing hardihood and strength, yet it is so strenuous that one should be in a fairly hard and vigorous condition before attempting it. It is not a sport for the weakling, for not only will he be unable to accomplish anything with his endeavors, but he will also be likely to strain himself. Therefore, unless one is fairly well seasoned in other forms of sport and exercise, it would be best to take two or three months of good, faithful training with special exercises, and perhaps a little distance running for endurance, in order to be fit for the mat.

It is unwise for the novice who knows nothing about the game to attempt to wrestle in earnest, that is to say, he should not strive hard to throw his antagonist, as in a match. He should first take up and study various holds and the means of breaking them, in order that he may make no mistakes or

acquire bad habits of style. Each hold should be secured quickly time after time, without exerting too much, and practiced in this way until it is mastered. After thus mastering the important positions, the pupil will be ready for real wrestling. As in other things, practice is the essential to good form, and much will be learned in this practice. Special attention should be given to bridging, for there are many circumstances in which this is temporarily the only way of avoiding a fall. This will also strengthen the neck for resisting other holds.

The first thing to be done, as one faces his opponent, is to get him off his feet, putting him on his back at the same time if possible, but at least getting him under so as to permit of further aggressive efforts. Once on the mat one is either aggressor or on the defensive.

While on the defensive one should always be alert for opportunities to take the aggressive. Especially should he be ready to seize the arm of the man on top and roll over, thereby rolling him on his back. On the other hand, the aggressor must be careful to watch out for such tricks. It is well to keep the elbows close to the sides. While on the defensive, also, one should use his legs as a means of resisting many holds. Clever wrestlers depend upon their legs in this way a great deal, locking or hooking them in those of the aggressor. In all arm holds it is well to take hold as far down as possible, preferably at the wrist, for this gives a greater leverage. The mechanical principle of leverage is involved a great deal in wrestling, for much of the work consists in turning over on his back a more or less prostrate and stubbornly resisting man. Reaching under his body and taking hold of the "further arm" or the "further leg," therefore, are common holds. This principle of leverage for turning him over is also applied in the various "Nelson" holds.

When on the offensive, use the weight of your body as much as possible, for this will not only help to give you power in many instances, but it will help to tire out your adversary all the more quickly. When working over his shoulders simply

(Continued on page 988)

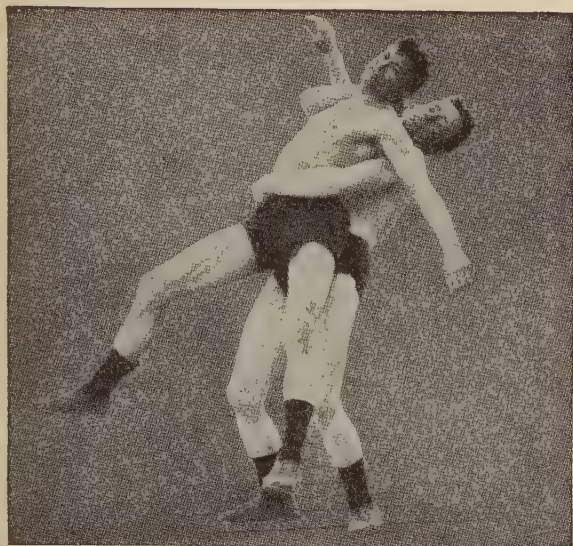
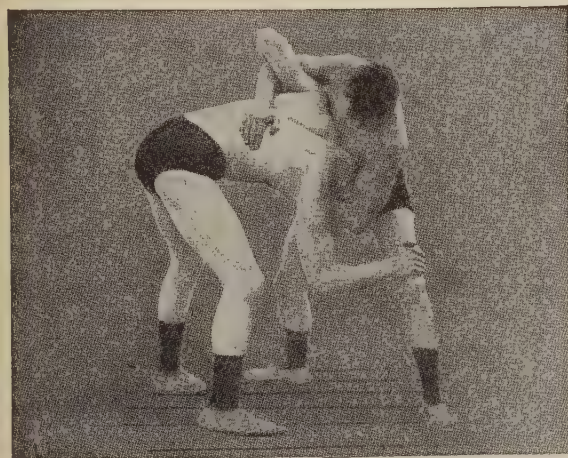


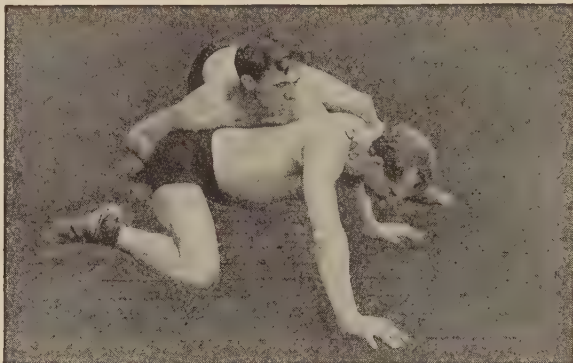
Illustration of Half-Nelson and Body Hold. Getting behind one's opponent may often be accomplished, when he reaches for a head hold, by seizing the back of his elbow and pushing him half around, whereupon you may step quickly behind him and secure a waist lock from behind. From the waist hold slip the right arm up to the half-nelson shown. Now fall backwards, retaining the hold, and when near the mat slip out from under, also securing a "scissors hold" with the legs to pin his hips down by fastening his body across the waist between both legs and locking or hooking your ankles about those of your opponent.



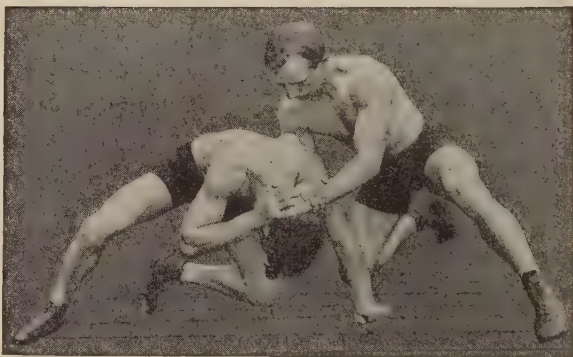
Bar Hold and Forward Chancery. A bar hold consists of getting a leverage with the arm, passing under opponent's arm and over his back. It is much used for turning a man over when down upon the mat. A Chancery hold is a grip on the head, in this case from a forward position. Step back quickly with left foot and jerk opponent to the floor, then forcing him over on his back. This may be resisted by the other man stepping forward and getting a crotch hold with the free arm, at the same time slipping the left arm upward to aggressor's neck, then lifting him up off his feet and throwing him.



A Good Illustration of the Half-Nelson. This consists of passing the arm under the other's arm, upward and across the back of his neck, forming an effective lever for turning him over. In this case it is combined with a further arm hold, which will help in forcing him over. It may be conveniently combined with a similar further leg hold or any other hold. First push down opponent's head with other hand to help get the half-nelson hold.

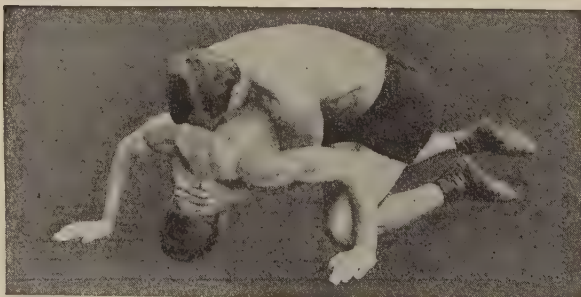


A Combination of the Half-Nelson and Crotch Hold. A crotch hold is very effective in many cases for lifting the lower part of opponent's body off the floor, either for throwing him over or helping to roll him over with the aid of some neck or arm hold. The crotch hold should be practiced in combination with all other possible holds.



The Quarter-Nelson. This has the same principle as the half-nelson, except that it employs both arms, the left hand being placed on the back of opponent's neck, and the right arm, passing under his arm-pit, so that the right hand may grip the left wrist or forearm. Braced in this way, the two arms form an effective lever. To resist this, pull head down and far away to the right, pushing aggressor's hand off

neck with the right hand, at the same time bringing left knee and leg forward in such a way that you will sit down with back to aggressor.



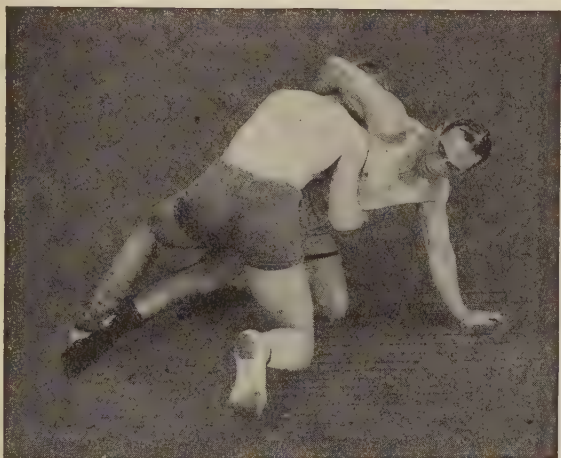
The Full-Nelson, consisting of a combination of near half-nelson, and "further half-nelson," locking fingers back of opponent's neck. It gives a powerful leverage, but is not much used among clever wrestlers because it gives too many opportunities for countering and rolling to the man underneath. The further half-nelson is a good hold in itself, being a half-

nelson applied under opponent's further arm. A three-quarter-nelson consists of a half-nelson reinforced by the other hand under the body, instead of passing the arm over the body and under the armpit as in the full-nelson.



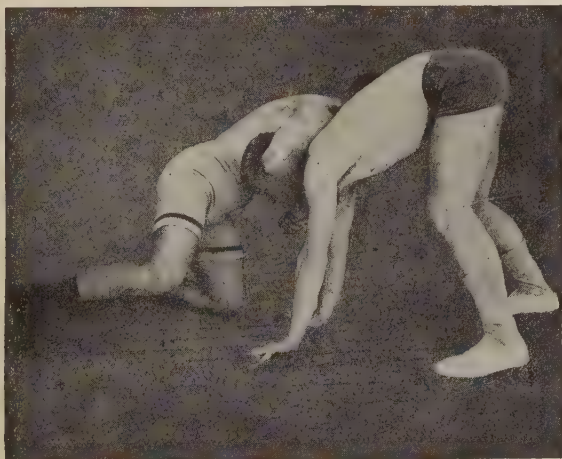
NUMBER 1.

This position generally results from an attempt on the part of the aggressor to get a hold on his opponent's legs. In this photograph, the figure to the right is the aggressor.



NUMBER 2.

The purpose of each man is to get behind his antagonist. The aggressor first pushes forward, crowding under his opponent, and bringing his head out over the side on which he has grasped his adversary's leg. The man on defensive must now relinquish his chancery hold on head of aggressor, or be exposed to half-nelson and crotch.



NUMBER 3.

If the man on defensive extends his legs back and prevents the aggressor from raising his head over his side, the aggressor plays safe by straightening up his legs with feet wide apart. In this position, he backs out of the scrimmage.



NUMBER 4.

Falling in his attempt to secure a leg hold by the customary method of grasping one of his opponent's legs, the aggressor may reach forward and secure hold on both legs of opponent.



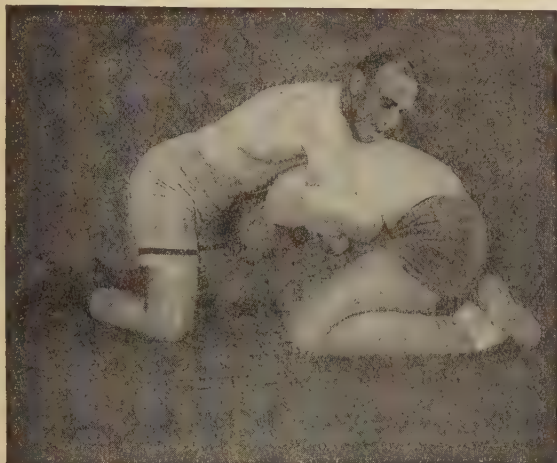
NUMBER 5.

Aggressor next sits back on his heels and puts all his strength to the task of lifting his opponent's legs upward, throwing the man on defensive clear over on his back. To do this, he must first break opponent's body-hold.



NUMBER 6.

As man on defensive scrambles on hands and knees, aggressor turns quickly and seizes him around waist with body-hold.



NUMBER 7.

By grasping his opponent's elbows and pressing them together, the man underneath may attempt to break the body-hold shown in photograph 4.



NUMBER 8.

After obtaining a firm hold on opponent's elbows the man beneath in preceding photograph may sit back on his heels and lift mightily, throwing his opponent clear over his head to his back on floor as here shown.



NUMBER 9.

While in position shown in photograph 3, if the man on defensive can get his knee between aggressor's feet as here shown, he may press forward in sitting position and obtain toe-hold on aggressor in this manner.



NUMBER 10.

The defender may then carry out this move as an attack, rising and bringing aggressor's foot with him.



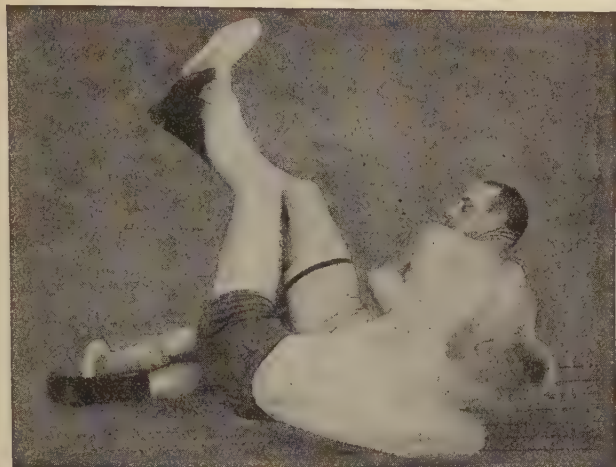
NUMBER 11.

Proceeding further with move, a half-nelson is obtained on aggressor with near arm, thus forcing him into trouble, as shown in this photograph.



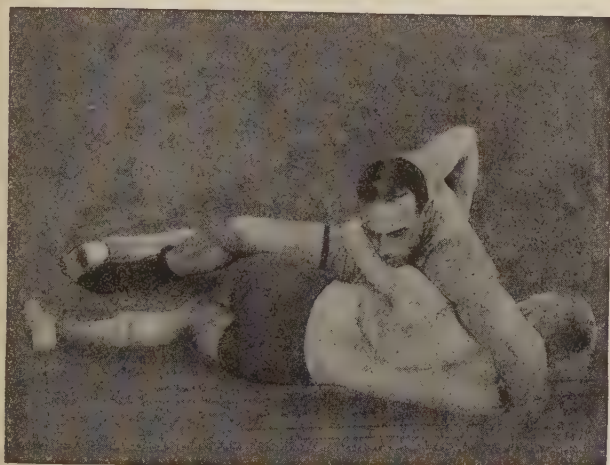
NUMBER 12.

From position shown in photograph 6, man on defensive may pinion aggressor's wrist firmly to side, then straighten leg on same side, and roll over as here shown.



NUMBER 13.

Continuing the roll shown in No. 12, the aggressor is turned over and his opponent's foot is hooked over his leg, while his arm is still held tightly.



NUMBER 14.

Further progress of roll is here illustrated, the man on top having meanwhile turned about to face his opponent, and prevented him from bridging by stretching effect of chancery and leg locks.



NUMBER 15.

This photograph shows final stage of roll and illustrates how the man beneath is forced to keep his head up and thus prevented from bridging by the use of his opponent's shoulder.

(Continued from page 980)

rest all of your weight upon him. The aggressive work is the harder, anyway, and if you can make him support your weight it will make it more interesting for him and help to even up the efforts on both sides.

After learning the first principles, as it were, one should devote himself to a study of the strategy of the game, for in wrestlers of nearly equal strength it is usually head work that wins. Feinting is as valuable as in boxing, or as in the operations of two opposing armies in the field. The purpose should be to conceal the real intention, to mislead as to the real hold desired, and then to get it indirectly. It is seldom that one can win a fall by the first hold attempted anyway, but one hold should serve as a means of getting another better. Learn to slip rapidly from one hold to another in order to keep your opponent bewildered, and once you have the right hold, work very quickly. Try to overwhelm him with your energy and speed before he knows what you are trying to do. Quick work is what counts in a great many cases, and a combination of speed and strength is necessary to make a really good wrestler.

The student of wrestling should make it a point to work out combinations of the simple holds, such as the combination of half nelson and crotch holds in one of the illustrations. Infinite variation may be secured by these combinations. It should be noted that the instructions given here are not expected or intended to make experts in wrestling, but the game is such a perfect exercise and of so much benefit in building both health and strength that every young man should try to find time to do some of it. Anyone may learn enough from these pages to be able to get the benefit of the exercise to be found in wrestling, and perhaps to make a fairly good wrestler from a competitive standpoint as well. I would especially recommend taking up the game in the amateur way. Professional wrestling has its place as a means of stimulating interest, but it is better to regard it merely as sport and exercise.

Some holds are avoided here because they are dangerous or unsportsmanlike, the strangle hold and hammer lock,

especially. The latter consists in doubling opponent's arm up behind his back and then twisting his wrist until he yields. The Flying Mare, though legitimate, may be dangerous. It consists in catching hold of adversary's arm when standing, turning back to him, getting shoulder under his armpit and then bending quickly far forward, throwing him over your head. It is sometimes an effective defense when threatened from behind.

The first six illustrations presented here show standard holds. For the balance of the photographs and for the following very interesting and useful suggestions on wrestling, I am indebted to Mr. Albert Treloar. He was the winner, some years ago, of the great International \$1,000 Prize Contest for the World's Most Perfect Man, held at the first Physical Culture Exhibition at Madison Square Garden, New York City, and was formerly a Harvard 'Varsity Oarsman. In recent years he has been Physical Director of the Los Angeles Athletic Club. His article follows:

AMATEUR WRESTLING.

By Albert Treloar.

Amateur wrestling in America differs from professional wrestling in several ways. First of all it bars the hammer lock, strangle and full nelson holds. But the A. A. U. authorities have made the most sweeping changes and have made the whole generalship and purpose of the amateur game different from the professional, making the rolling fall valid. In professional wrestling there is of course but one ultimate object, the pinning of the shoulders of one's antagonist to the mat. The decision to the more aggressive of two wrestlers after a limited bout virtually makes the final purpose of amateur wrestling to get on top of one's opponent and stay there, for nine out of ten referees will award the decision to the man on top. So the crafty amateur who is out to win medals will study first the many chips and tricks and strategies that lead to the uppermost position, while the methods of actually gaining the fall will be considered of less importance.

The first purpose in amateur wrestling is to get behind your opponent and stay behind. In wrestling parlance the word "behind" means also "on top," when on the mat except in certain positions in which one man may be above his opponent's head end for a moment but not yet established in the uppermost position.

It is of course impossible in the space of this article to detail all the ways of getting behind. There is one position, however, which is almost certain to occur many times in every wrestling bout. This position, shown in Photograph 1, generally results from an attempt on the part of the aggressor to get a hold on his opponent's legs. From the fact that this position is so easily brought about and does actually occur so frequently in amateur bouts, a thorough understanding of all the possibilities of the position, both from the standpoint of attack and of defense, will be of immense value. Keeping in mind that neither man has any idea of scoring an immediate fall and that the purpose of each is to get behind his antagonist, let us see the next move of the aggressor. Pushing forward, crowding further under and improving his hold on the leg, he next brings his head out and up on the same side of his opponent as the leg he is grasping. Then pushing his opponent sideways and downward with his head the aggressor climbs around to the position behind. (Photograph 2.)

His opponent must then relinquish chancery hold, or be exposed to half nelson and crotch. Again, supposing that in the position of Photograph 1, the opponent, at that moment on top but not behind, extends his legs back and prevents the aggressor from raising his head to the side. The opponent now by holding down the aggressor's head, has a good chance to scramble around to a position truly behind and on top of the aggressor, establishing himself there with both arms around the hips. The aggressor, however, seeing that his attempt to get behind by means of a leg attack has failed, plays safe, that is, he straightens up his legs with feet spread wide apart, making his back end high and front end low. In this position he backs slowly out of the scrimmage untangling the

opponent's chancery and other holds till he is free as at the start of the match. This move is illustrated in Photograph 3.

The aggressor has thus made a try for the legs, failed, and come out again without loss. A thorough master of all the possibilities of the position shown in Photograph 1 can try again and again for the legs with little fear of his opponent's coming behind him in the scrimmage. By no means all of the extremely interesting and scientific developments of the position of Photograph 1 can be described in this limited space. In fact, a complete discussion of this very important and frequently occurring situation would take several times the total space allotted to this article.

There are, however, two other phases of this scrimmage which may often be worked through by amateurs. Suppose that the aggressor, the man for the time being underneath in Photograph 1, instead of having one of his opponent's legs, has both with an outside grasp. The regular way to grab the legs is with your right hand reaching for the inside of your opponent's right leg or your left hand for his left leg. But in a scrimmage all rules are broken and the wrestler takes what he can get. From his outside grasp of both legs the aggressor may change to one leg, raise his head out to the side and execute the manoeuvre described before, or, retaining his outside grasp of both legs, he may pull his opponent to him, thrusting his head clear through as in Photograph 4. Aggressor now sits back on his heels and lifts mightily with neck and shoulders, throwing his opponent clear over his back. Photograph 5 shows the throw and aggressor's change of hands to raise opponent's knees clear, thus guarding against a possible scissors on head. Opponent falls free on hands and knees and aggressor turns and scrambles with his utmost speed to grasp opponent round the body as in Photograph 6.

In Photograph 4 the body hold, which opponent has on the aggressor, is a very dangerous thing for opponent. If aggressor has difficulty in executing the throw shown in Photograph 5, he may hug opponent's arms to his sides as in Photo-

graph 7, then sit back on his heels and roll opponent into serious trouble or into an actual fall as in Photograph 8.

Neither the throw shown in Photograph 5 nor the roll illustrated in Photographs 7 and 8 could ever be worked on a highly skilled wrestler, for a cautious man would never be in positions exposing himself to such tricks, but my pupils have worked them successfully time and again on amateur antagonists supposed to have a good deal of class.

Once safely established behind, as in Photograph 6, the aggressor is ready to start a number of highly scientific and carefully studied out plans of attack. But in the meantime he must look well to his position. Even the waist hold by which aggressor holds opponent down (Photograph 6) exposes aggressor to several assorted types of side rolls. Some wrestlers become so expert at these that they let their antagonists take the uppermost position in Photograph 6 and then almost in the twinkling of an eye reverse the position by means of a side roll. It is usually poor generalship, however, to go voluntarily underneath in the hope of working a roll. Again the opponent may exhaust the aggressor's strength by repeatedly scrambling to his feet, which necessitates the aggressor bringing him to the mat again. Of the many highly elaborated ways of attack from the upper position of Photograph 6, it is impossible to speak here. Up to the attainment of his position on top, the aggressor has thought only of getting behind his opponent. Now he tries for a fall.

From Photograph 6 a clever opponent may escape from the underneath position in several different ways. If aggressor moves forward for some attack around opponent's head end, opponent may back up, turn head toward aggressor, and play safe out of the scrimmage as in Photograph 3. Again, if he can get his knee between aggressor's feet, he may sit toward aggressor, bringing the foot out in front of him, as in Photograph 9. The move may then be carried out as an attack, opponent rises and brings aggressor's foot with him, takes half nelson with near hand and forces aggressor into trouble as in Photographs 10 and 11. If this manoeuvre

cannot be completely worked through, opponent will at least have come out on top.

From position of Photograph 6, opponent (the man underneath) may seize aggressor's wrist, press it firmly into his groin, then straighten leg on same side and pinion aggressor's forearm between the mat and opponent's hip bone, then rolling over, opponent lifts aggressor's back end with his foot, next opponent's free arm takes chancery on aggressor's head, opponent's free leg hooks over aggressor's leg, opponent still holds aggressor's wrist, winding himself up in aggressor's arm. Aggressor's bridge is then broken by the stretching effect of opponent's chancery and leg locks, in fact aggressor is stretched out flat on his back. The progress of this roll is shown in Photographs 12, 13, 14 and 15. Often this roll is only partly successful but opponent rolls himself right out from under aggressor and up on top. Photograph 13 shows how opponent keeps his head end pretty well up by supporting himself on his elbow.

The physical strength and toughness derived from wrestling make it one of the most valuable of exercises. But the character development resulting from its practice is of even greater value. The qualities of courage, pertinacity, and alertness, the ability to endure punishment, to attack vigorously without anger, to win without exultation, and to lose like a true sportsman, these the young wrestler must strive to attain.

YACHTING.—For those so situated that they can enjoy the delights of yachting, this is one of the valuable sports for taking one out into the open air. It is true that the exercise involved in the handling of the boat is not extensive, but the atmospheric conditions are ideal for promoting health and vigor. A good breeze is always favorable, not only to the requirements of deep respiration, but also to the activity of the skin. It is invigorating and stimulating, just as any air bath, because a stiff wind usually blows through ordinary clothing. Furthermore, on the broad stretches of the water one is free from the dust which sometimes follows the motorist, even in the country.

CHAPTER IV.

THE PHYSICAL DIRECTOR AND HIS WORK.

THE profession of physical director dates back beyond the Greek Games and the Roman Circus. Yet it is within comparatively recent years that the physical director has been accorded a fitting place in educational institutions and elsewhere in civilized life. The greatest strides have been made in this direction since the beginning of the twentieth century, as evidenced by the constantly growing number of physical instructors in our elementary and high schools as well as in colleges, by the increasing army of playground instructors in the service of our cities and states, and in many other quarters.

TRAINING.—A few foresighted and public-spirited pioneers in the field of physical instruction anticipated, even a generation ago, that there would arise need for great numbers of instructors in physical culture, and that the men and women to be entrusted with this task must be properly trained for their work. As a consequence, the physical director, like the member of other professions, may now thoroughly prepare himself for his lifework by a term of systematic instruction and training at a properly qualified school or college, instead of depending entirely upon experience to develop his equipment.

EQUIPMENT.—It may be noted that the equipment demanded in the physical director extends far beyond that required in the trainer or coach, and that it deals with many aspects of health-building not strictly athletic or in the nature of exercise, while all tending toward physical betterment. The modern institution for training the physical director, if it perform its work properly, sends its graduate out to serve the world with a thorough knowledge of anatomy and physiology, with a thorough and complete acquaintance with modern methods of sanitation, hygiene and of such corrective and curative service as he may be called upon to render, and with



A Class of Army Physical Directors in Training.

full knowledge of the relation of diet as well as exercise to health. All of this, entirely aside from his qualifications as an instructor in gymnastics, in athletics of every sort, and in methods of developing various types of physique.

Books devoted to improving the equipment of the physical director also have been produced in greater number during recent years than ever before. As an instance, the present work has been designed to serve those engaged in training others to build health and strength, as well as for personal use in one's own case.

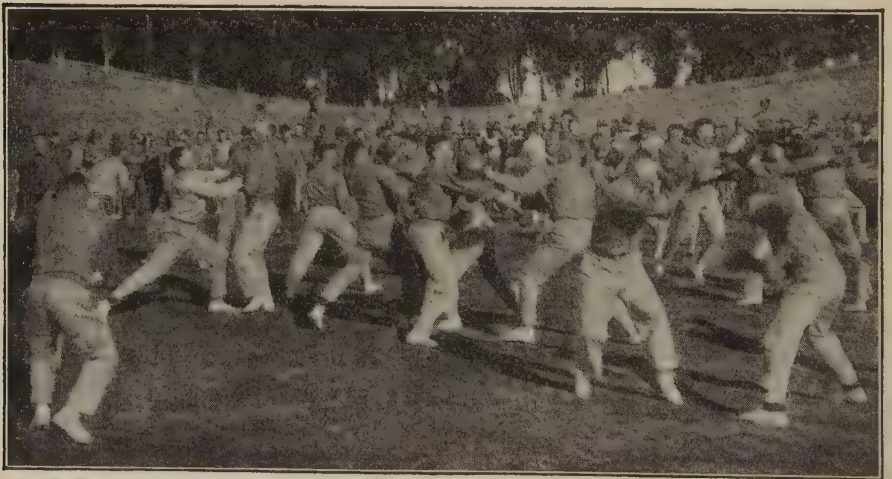
WHAT MAKES THE EFFICIENT PHYSICAL DIRECTOR.—The same qualities that make for effective leadership in other walks of life are essential to successful service as physical director. Foremost among these are proper equipment and training, an absolute belief in the value of one's work, an earnest desire to develop the very best that one can in oneself as well as those in whose training one plays a part, and a sincere enthusiasm which will communicate itself to even the most apathetic pupil. To which may be added tactfulness, ability and willingness to study the individual needs and idiosyncrasies of the pupil, and that fundamental requirement, personality.

The effective instructor attacks the movements of the drill with energy and vim, and describes them with enthusiasm also. His own spirit will be communicated to the class, and if he be indifferent the class will be even more so.

The manner in which commands are given is a vital matter. Every attempt must be made to cultivate a persuasive yet incisive tone of voice. Practice will aid in this. The tone and general manner of address should be such as to arouse the class to follow every movement with alacrity—to put them on their mettle, and this never can be attained by an air of superiority or by a bullying voice and manner. The instructor must use his voice and his authority properly to inspire respect and not antagonism in his class.

CLASS DRILLS AND HOW TO GET RESULTS IN THEM.—Class work in physical culture at the present time represents a very large proportion of the attention given to the subject throughout the whole world, and practically all schools and colleges now include a certain amount of such physical training in their courses. In many cases this is optional with the student, but in some schools it is compulsory.

Athletic clubs, and other organizations partly or entirely devoted to physical training, also find the class drill the most effective method of cultivating interest in systematic and progressive exercise. All this aside from the important part that the physical drill continues to play in keeping men in military service physically fit.



Officers in Training for U. S. Army Directors Engaged in Class Boxing.



Physical Directors of the Italian Army in Training.

Knowledge of how to effectively conduct class drills thus becomes an essential to the physical director.

To inspire his pupils with an unquenchable determination to attain superb health and bounding vitality, to develop in them keen interest and enjoyment of every moment they spend under his instruction, and to get tangible results by increasing the vigor and improving the physique in the instance of every member of his classes—these are the results for which the physical instructor must strive in class drill.

He must learn to select exercises that have not merely gymnastic value, but that will appeal strongly to his classes. He must interpolate dancing steps and breathing exercises frequently to keep up the interest of his classes, as well as avoid tiring them physically. He must exercise care to get spirited action and maintain proper cadence in arm movements, for instance employing different rhythm for leg and trunk exercises to get the best results in every form of movement. Variety, also, is a most important consideration.

CONDUCTING CLASS DRILLS.—The instructor should stand in front of the class at a distance that will permit all members of the class to see him readily, and that will permit him to observe all the pupils' movements also. A small platform or



Mass Drill In Wrestling Under Class Leadership.



Class Boxing Under Leader and Assistant.



Class Leader Directing Calisthenic Drill.

low table will prove useful if the class is large and the distance between the front rank and the instructor should be increased proportionately.

To obtain open formation, class may be first instructed to form columns containing equal numbers, then to raise arms at sides to insure that finger-tips barely touch their neighbors on either side, next to back-step to obtain two feet distance from those in front and back of them, and finally, to have every alternate pupil in columns side-step to right (or left) one pace. This provides a simple method of placing the class in opened ranks. In Chapter V, pages 1009-10, under the heads *Taking Interval* and *Taking Distance*, other methods of arranging class for drill are described. Other suggestions for preliminary marching at quick and double time, and for methods of giving commands in class drill, as they appear in that chapter, may prove helpful to the physical instructor even in non-military drill.

Ventilation is an important consideration when drills are conducted indoors. Every precaution should be taken to ob-



Convalescent Italian Soldiers at Drill Under Physical Director.

tain a constant supply of fresh air throughout the exercise period.

Again, indoor drills should have the stimulus of piano accompaniment throughout, whenever this is possible. Songs of the day, with which the class may be familiar, or which they may be interested in learning, may be used for this purpose.

Experienced instructors recommend that calisthenic drills that open with brisk but simple movements of the arms or of the legs, work up to more strenuous leg, and later, to trunk, body and head movements. Arm movements should be performed more briskly than leg movements, leg movements in turn, with more snap than head movements, and trunk movements most slowly of all to insure full benefit.

In his book on "Theory and Practice of Educational Gymnastics" Professor William A. Stecher recommends approximately this proportionate division of a half-hour exercise period:

Preliminary marching and free exercise.....	9 minutes
Marching and rhythmic steps or dancing.....	5 minutes
Breathing exercises	1 minute
Games	15 minutes
Total	30 minutes

CHAPTER V.

SETTING-UP EXERCISES FOR INDIVIDUAL AND CLASS USE.

PHYSICAL training proved a most important factor in the momentous war in which most of the great nations of the world were involved from 1914 to 1918. Especially true was this of the United States and Great Britain, for in these countries millions of men, for the most part utterly unaccustomed to sustained physical effort, were called upon for duty involving exertion and endurance such as had never been demanded of them before.

The men who made up the armies of the United States came to the training camps from the office, the factory, the shop and the farm, and they differed more widely in their physical equipment than have the rank and file of any army the world has ever known. Men whose lives had been practically spent indoors, men who had not since boyhood vigorously used any set of muscles save those called into play by their daily work, men who had never walked even a fair stretch in many years—all of these it was necessary to make capable of performing the same strenuous tasks. The underfed offspring of the city slum must be able to carry the same weight, to march the same distance, to develop the same endurance, to charge with the same force as the sturdy son of the western plains—and the physique of all must be developed to the same degree of fitness. By sound and effective methods all of this was accomplished.

MILITARY AND PHYSICAL TRAINING.—Military training, having as its purpose the maintenance of the greatest possible degree of efficiency in the individual, involves, no matter what form it may assume, some sort of physical training. Drills, marches, field evolutions, tactics of offense and defense, all accomplish this consequence in some degree. Yet there is one particular form of training taken up at the very outset of preparing men for military service that is more effective than

all others in the upbuilding of the body, in cultivating alertness, in developing a strong and well-rounded physique. This form of training also is applicable to the needs of the individual seeking physical improvement for reasons not of a military nature. For these and other reasons it is well worth while to study the progressive setting-up exercises that serve as the basis of the physical training of the United States army.

The system of setting-up exercises pursued by the troops in the American service today was developed chiefly by Major Koehler, physical drill instructor for many years at West Point Military Academy. Its value in the training of the soldier and the civilian as well is well described by Captain William H. Wilbur, U. S. A., in these words:

“ . . . It is readily seen that the physical drill, properly used, is an absolutely essential element in the making of good soldiers and better citizens. It contains the best elements of military training in a single vehicle and should be adopted as an obligatory part of the training of all our school children, not physical *training* only, but physical *drill*, mind as well as body, training for the brain as well as training for the muscles. . . . ”

SETTING-UP EXERCISES FOR INDIVIDUAL USE.—Women as well as men, and growing youngsters as well as those of mature growth, may make use, with common sense, of the major portion of the setting-up exercises suggested in this chapter. The one important thing to keep before those who use these movements, whether in class or individually, is that they should be performed with snap, with vigor, and with such alertness as to insure the development of immediate and complete control over the body, no matter how disturbed or distracted the mind may be. To perform them in such manner is to insure, also, the best results in the development of strength, endurance and symmetry.

SETTING-UP DRILLS FOR CLASSES AND SQUADS.—Developed as they have been for the use of men in groups, setting-up exercises attain their greatest possible effectiveness when they

are performed under leadership, in class drill. This, because the pupil is by proper direction stimulated to vigorous action, and through the spirit of competition with those about him to sustained endurance, and because the self-discipline incident to instant compliance with the spoken command has marked effect in promoting physical control and self-reliance. These results, to be sure, must depend in great measure upon proper leadership, and thus this chapter is chiefly addressed to those who may serve as leaders of class drills of any number, large or small.

In actual military usage the groups of men receiving calisthenic instruction are described as squads, platoons, companies, battalions or larger units, but in this book the groups are mentioned as classes because the drill work described may be applied to other purposes than those actually military.

Yet the military methods upon which the drills are in great measure based may be retained. In military fashion a command of preparation should first be given to the class as: FORWARD—followed by a command of execution more sharply accented, as: MARCH. As another suggestive example, as a command of preparation: ARMS OVERHEAD should be followed by: RAISE, as a command of execution. (It may be noted that commands of preparation appear here in SMALL CAPITALS, commands of execution in CAPITALS.)

The movements of various exercises should be performed in cadence, as the steps are taken in marching. Such an exercise as swinging the arms from sides overhead will be performed in the same cadence as ordinary marching, in which 120 steps are taken to the minute, two steps to the second. To insure uniformity of speed and vigor of action, the movements of the class should keep time to the spoken count of the instructor.

In such movements as the arms-overhead exercise cited, as an example, one count should be given for the upward, another for the downward swing, thus in: ARMS UPWARD, RAISE: at *One* arms should be swung overhead, at *Two*, arms are again swung downward, and so on until it is desired

to discontinue exercise, when, instead of the last number, the word **HALT** is used, changing the inflection of voice so that the number that precedes **HALT** will serve as a command of preparation. Some movements are based upon counts of four instead of two; in these the same rules apply.

The effectiveness of the drill will depend in very large measure on the manner and voice of the instructor. His position should provide the class with a correct example of posture, and his manner and voice should be earnest and inspiring. Good results cannot be expected from lackadaisical or arrogant speech or mannerisms.

DETAILS OF CLASS DRILLS.—After the command **FALL IN** the instructor may arrange class on a designated line, placing men by height, the tallest and next tallest beside him, and so on, with the smallest pupil at extreme left. The class then may be divided into two ranks. To insure that men of nearly equal height are grouped together, the first four men may stand fast, while the four men at their right move back and take places immediately behind them, thus making a squad of eight men; the same disposition may be made of the next eight men in line, and so on.

As here used, a “rank” is a row of men side by side, a file is a row of men in a row from front to back, and a squad is a body of men four side by side and two deep.

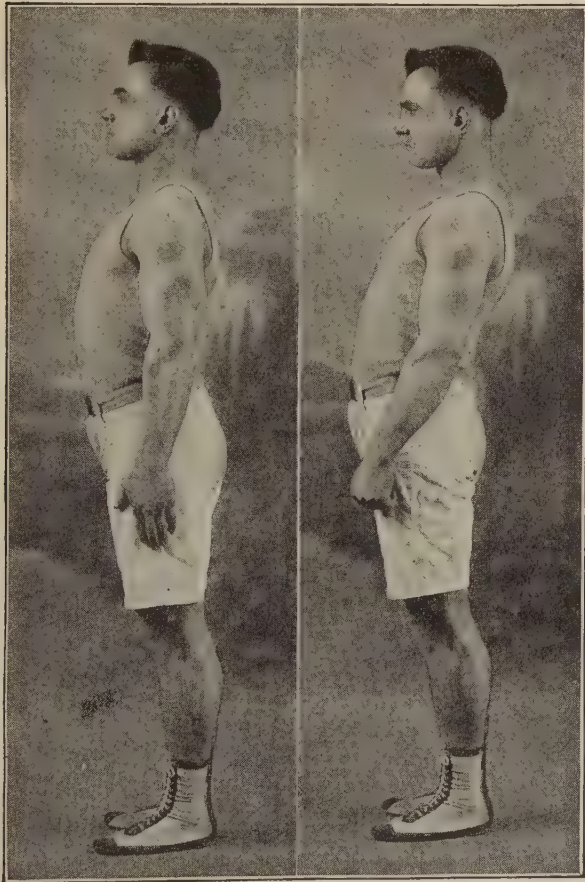
At the command **COUNT OFF** all men except the one at extreme left of line turn head and eyes toward left, while the front and rear ranks both announce the number of the file in which they are stationed in each squad. Thus the first man at left calls out *One*, the second *Two*, the third *Three*, and the fourth *Four*, as they each bring their eyes to the front. The men in the front and rear ranks of the first squad may thus be designated by the instructor in his commands, as numbers one, two, three and four of their respective ranks, and this procedure followed with every squad in the same manner.

Posture.—At the very outset the class should be instructed upon the proper position to assume while standing, as most of their exercises will begin in this position. With the heels

together, on the same line, the feet should be turned out equally to form an angle of about forty-five degrees, (modern practice favors toeing straight ahead), the weight being carried chiefly upon the balls of the feet. Without being stiff, the knees are extended, the hips are level and drawn back. The chest is raised, the shoulders thrown back and downward, the arms hanging naturally so that the hands fall back of the seams of the trousers, with the palms turned toward the body. The chin may be drawn in to help maintain the proper posture of the chest and shoulders, yet it is important to carry the head well up and erect, with eyes directly looking forward at some object of not less than their height from the ground. The

posture as a whole should stamp the man who assumes it as alert and resourceful of body and mind.

The class will be impressed with the importance of assuming this position with a snap at the command "ATTEN-TION," in which, whenever used, the first syllables serve as a command of preparation and the final syllable, properly accented, as a command of execution. The class may be instructed that when the command "AT



Correct Position.

Incorrect Position.

—EASE” is given they may relax, but that the right foot should remain in the same position it will occupy when again brought to attention, so that alignment may not be lost.

Marching.—In military physical drill it is customary to precede calisthenics by marching the men at quick-time and double-time until they are well warmed to their task, and quickly responsive to instruction. In quick-time, which is ordinary marching, 120 paces are taken to the minute, or ten paces to five seconds, with a thirty-inch step. In double-time the knees are bent somewhat as in running, to permit doubling the number of paces to the minute, the arms also being bent at the elbows and drawn up somewhat as in running.

In marching the feet are not turned out and the posture of the body should be as carefully maintained as when at “Attention.” Drawing in the chin slightly will assist in carrying the chest well up and will help one to draw the shoulders back with freedom so that the arms may swing naturally and helpfully, with the hands open.

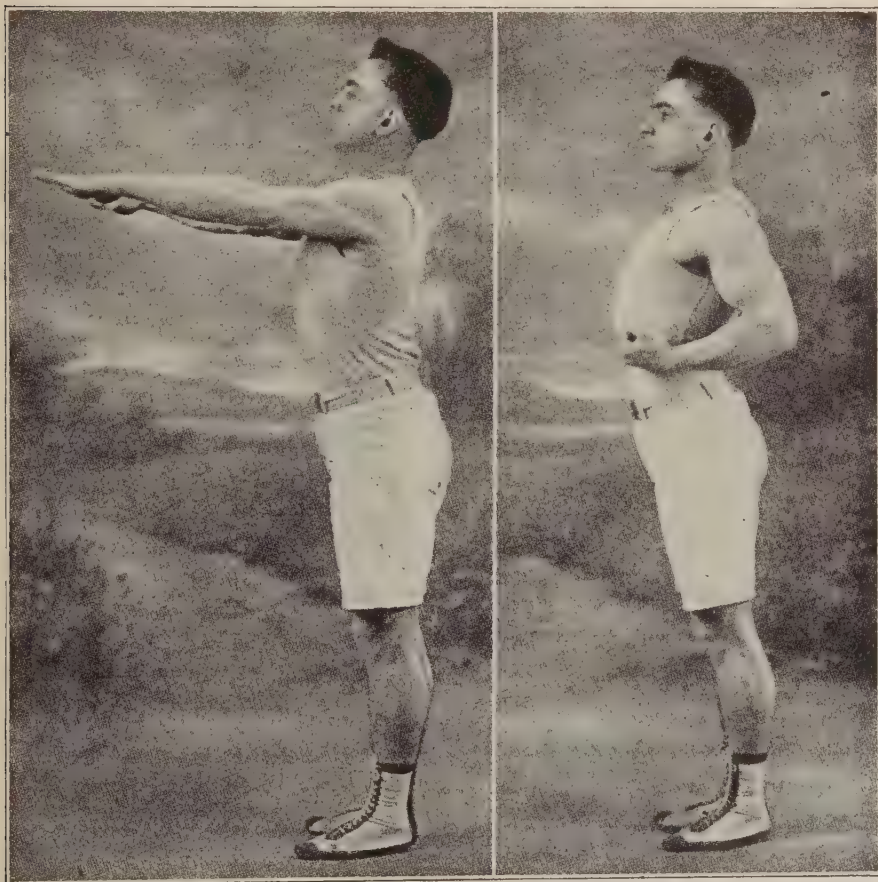
The class should be instructed that at the preparatory command FORWARD the weight should be shifted slightly to the right foot with an imperceptible movement. At the command MARCH the left foot is carried forward smartly and placed thirty inches in front of its starting point, the right foot then being advanced the same distance. This continues until the command CLASS (or SQUAD) HALT is given, when the foot at that moment striking the ground will take one step further and the other foot brought up to join it smartly with the pupil in the position of attention.

To change the direction in which the class is marching, the command of execution CLASS (or COLUMN) RIGHT (or LEFT) may be given. At the command of execution MARCH the leading rank, or leading pupil, if in single column, turns squarely to the right upon the right heel, or to the left in similar fashion, as he is commanded. To march backward the command BACKWARD, MARCH is used when class is at a halt; the command TO THE REAR, MARCH, being employed for the same purpose when class is in motion. The class may

change location from right to left for short distances by the command **RIGHT (or LEFT) STEP, MARCH.**

In marching and in drills and exercises of every sort, the class will continue the movements they have been commanded to perform until given the command **CLASS (SQUAD or COMPANY), HALT.**

Facings.—Marching exercises may be begun with instructions to assume with alacrity and snap the right and left-face and about-face positions. In executing the command **LEFT FACE** the body is pivoted on the left heel by raising the ball of the left foot and pressing on the ball of the right foot while



Movement 1. Final position. Arms forward, **RAISE.**
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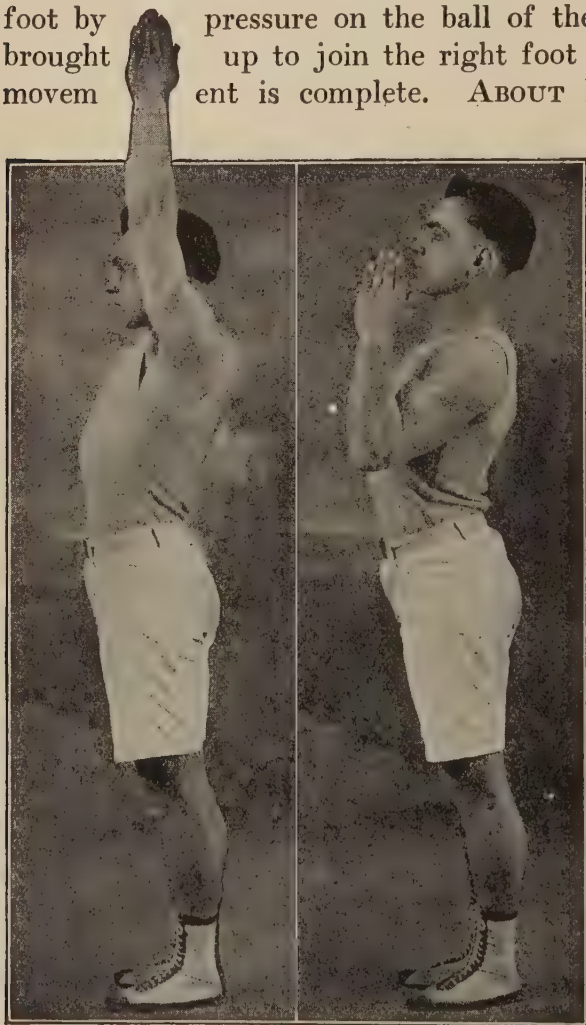
Movement 2. First position. Arms up, **THRUST.**

raising its heel, to make a turn of ninety degrees to the left.

This procedure is reversed at the command **RIGHT FACE** so that original position is resumed. In both right and left face the movement is completed by bringing up the free foot so that the heels resume their original alignment with a "click." **ABOUT FACE** is executed by drawing the right foot four inches, or about half its length, back of the left foot, and then pivoting the body completely around on the ball of the right foot by pressure on the ball of the left foot, which is brought up to join the right foot with snap when the movement is complete. **ABOUT FACE** is executed

to the right always.

These facings may be used to finish up as extended a period of marching and double-timing as the instructor may deem necessary, not forgetting that the object is to invigorate and prepare the class for its work, and not to tire it. The next step is to have the men in the rank and file of the class station themselves to permit free movement in their calisthenic work. This may be accomplished either by



Movement 3. Final position. Arms over head, **RAISE.**

Movement 4. First position. Forearms to the vertical, **RAISE.**

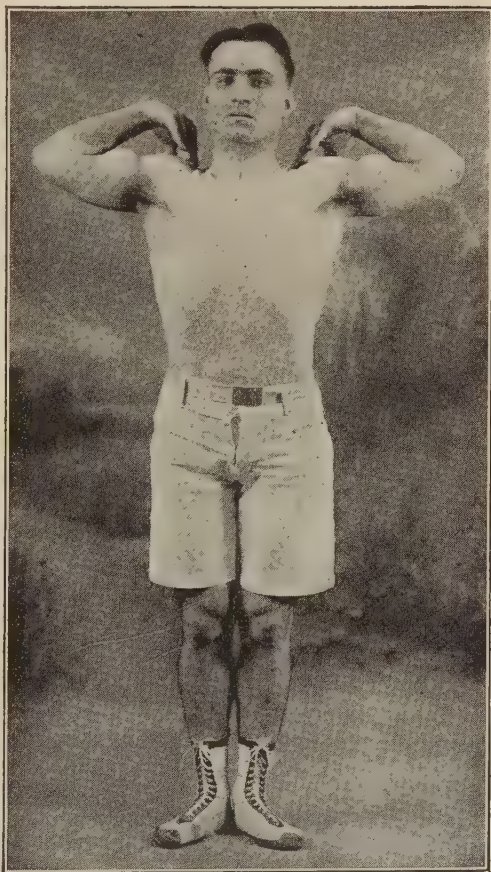
increasing the "interval" or the "distance" between the men.

"Interval" is the space between the arms of the pupils as they stand side-by-side and should ordinarily be about ten inches, or such space as will permit the pupil to touch the side of the man at his right with the elbow when the right arm is held akimbo, with palm placed flat on side of hip, with the fingers downward and close together.

"Distance" is the space between the pupils in the front rank and those behind them, and should be maintained at about forty inches, or as far as will permit those in the rear rank to extend the arms completely and barely touch those in the rank preceding them.

Taking Interval.—

The class, when ready for calisthenics, and facing the instructor in squads or otherwise, may be given the command: **RAISE ARMS AND TAKE INTERVAL RIGHT AND LEFT, MARCH.** At the command of execution, pupils number one and two of both ranks execute right step (stepping sideways to their right), pupils numbers three and four of both ranks execute left step (stepping sideways to their left), all raising the arms and coming to a halt without command when finger-tips no longer touch. After the command **ARMS DOWN** to all, the rear



Movement 5. Hands on shoulders, PLACE.

rank alone is given the command: **REAR RANK, RIGHT STEP, TWO STEPS, MARCH.** This will place pupils in rear rank in position to observe instructor, and be under his attention, and to move freely as well, instead of behind those formerly in file before them.

Taking Distance.—Similar results may be obtained when it seems more convenient by letting the class take distance, at the command **TAKE DISTANCE, MARCH.** At this command all the numbers one of the front rank march to the front, all the numbers two follow them after four paces have been taken, numbers four in turn after four more paces, then numbers



Movement 6. Hands on hips,
PLACE.

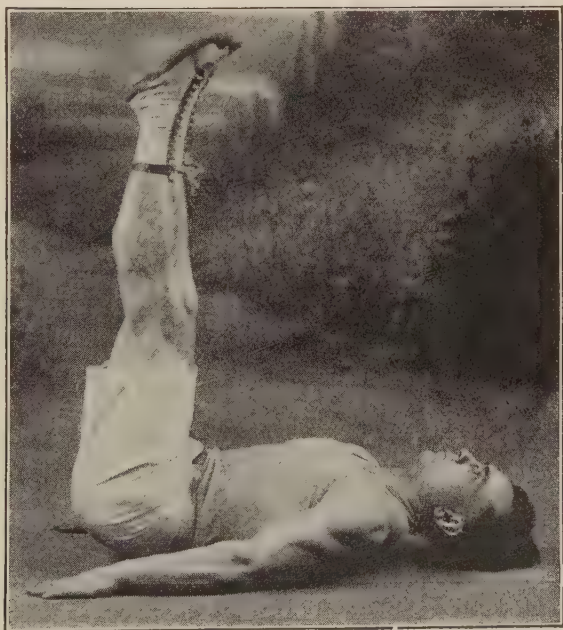
Movement 7. To the straddle position,
HOP.

one, two and three and four of the rear rank repeat the procedure until the "distance" between pupils is increased four paces in every instance.

MAKING UP DRILL PROGRAM.—The exercises depicted and described in this chapter are all designed chiefly to illustrate the most useful forms of exercises to employ. The instructor will find it preferable, perhaps, to arrange his own program. In making up the setting-up drill program, the actual exercises that one may select are secondary in importance to thoroughness of method in application. Those personally accustomed to systematic exercises, or those with training as instructors, have learned through experience what forms of exercise they deem suited to various situations. Such exercises as those described and illustrated on pages 641 to 671 of the present volume are particularly well adapted to the purpose, as are other standard forms of calisthenics, dumb-bell and other drills.

Unless otherwise stated, all of the movements here suggested are begun from the position of "Attention," but in some instances it is necessary to begin a movement from the last position of the movement preceding it.

Movement One.
—**ARMS FORWARD, RAISE.** From the position of "Attention," arms are brought up with a snap to forward horizontal position to the height of shoulders, keeping elbows and wrist straight, with the



Movement 8. Raise legs to vertical position, RAISE.

palms of hands down, and separated the width of chest.

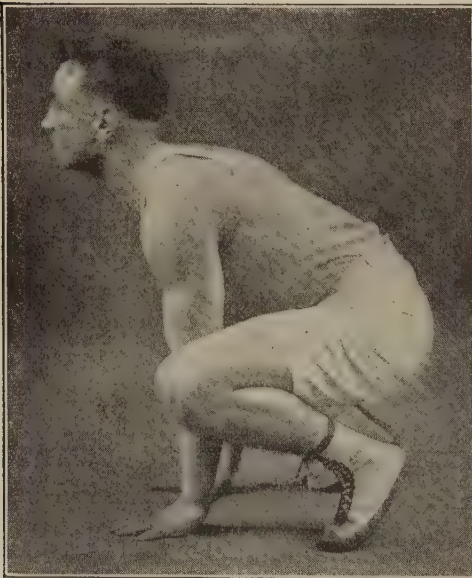
After movement is explained and illustrated by instructor, class will proceed to perform it in cadence with his spoken count, upon the command **READY, EXERCISE: One, two, etc.**

Movement Two.—**ARMS TO THRUST, THRUST.** Forearms are brought up with a snap to horizontal position, elbows bent and forced well back, wrists straight, fists clenched, chest up and head well elevated, repeating movement with each count.

Movement Three.—**ARMS OVERHEAD, RAISE.** From position of "Attention," arms are raised to vertical position, palms facing each other, being returned with a snap at the proper count to first position, repeating with count.

Movement Four.—**FOREARMS TO THE VERTICAL, RAISE.** With the upper arm remaining in place, the elbow is bent and the forearm brought up to vertical position, with the wrist straight, palms of hands turned in, and the hands at height of shoulders. Return to first position at proper count, and continue.

Movement Five.—**HANDS ON SHOULDERS, PLACE.** First



Movement 9. To the squatting position, BEND.

raise the forearms to the position of last exercise. Then bring up elbows to height of shoulders and turn hands to touch shoulders with tips of fingers, performing entire movement with vigor. Return to first position at spoken count, and repeat.

Movement Six.—**HANDS ON HIPS, PLACE.** Raise hands and place them on the hips, fingers horizontal, thumbs to the rear, elbows carried well back.

If used as an exercise, return hands smartly to first position at the spoken count, unless other movements are to be continued from hands-on-hips position.

Movement Seven.—TO THE STRADDLE POSITION, HANDS ON HIPS, HOP. From position of *Movement Six*, a hop is executed at command of execution, the legs being separated at same time to a distance of about thirty inches. Movement should be made on toes, the position assumed without jar. Body is held erect. Return to original position at proper count unless other movements are to be continued from new position.

Movement Eight.—RAISE LEGS TO VERTICAL POSITION, RAISE. Assume prone position, then at count *One*, bring legs to vertical position illustrated, returning to prone position at second count and continuing until count terminates.

Movement Nine.—TO THE SQUATTING POSITION, BEND. From position of *Movement Seven*, lower the body by bending the knees until resting on heels, placing hands between feet, palms down, with body inclined forward, chest well raised.

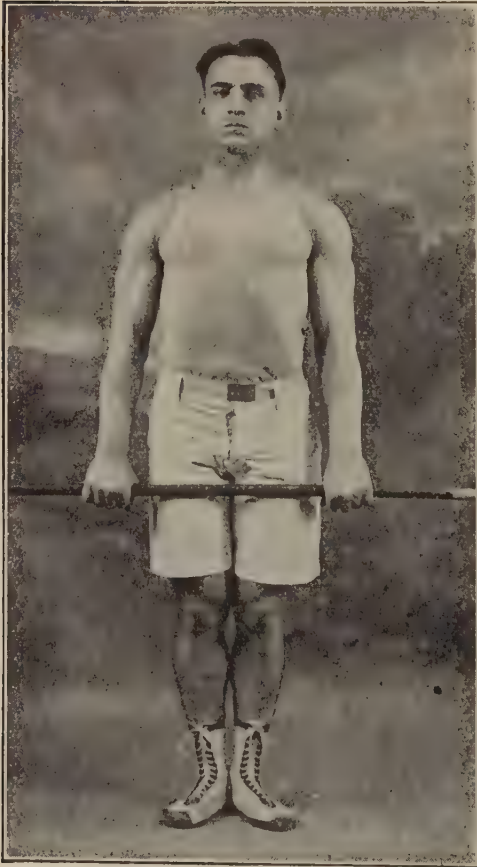


Movement 10. Legs backward, EXTEND.

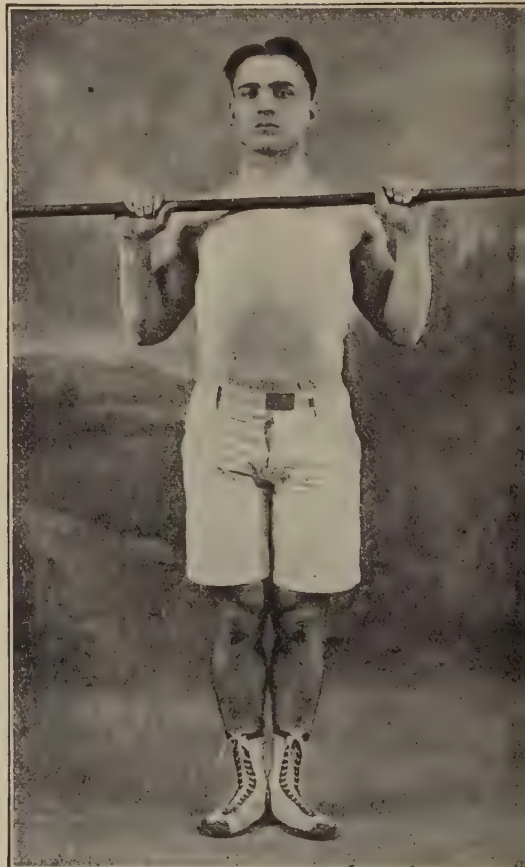
Return to position of attention at proper count, unless further movements are to be made from new position.

Movement Ten.—**LEGS BACKWARD, EXTEND.** From position closing *Movement Nine* the legs are shot backward with a snap to position illustrated so that body is supported on palms of hands and on toes. Return to squatting position at proper count and continue so long as counts continue.

RIFLE EXERCISES.—The following movements are based upon rifle exercises in use in the army physical training. A staff or wand of suitable nature may be used instead of the rifle, to be sure, though it must be remembered that the lighter weight of the substitute may demand more vigorous



Movement 11. Position, ARMS.



Movement 12. Shoulder horizontal, RAISE.

and sustained movements than when the rifle is used.

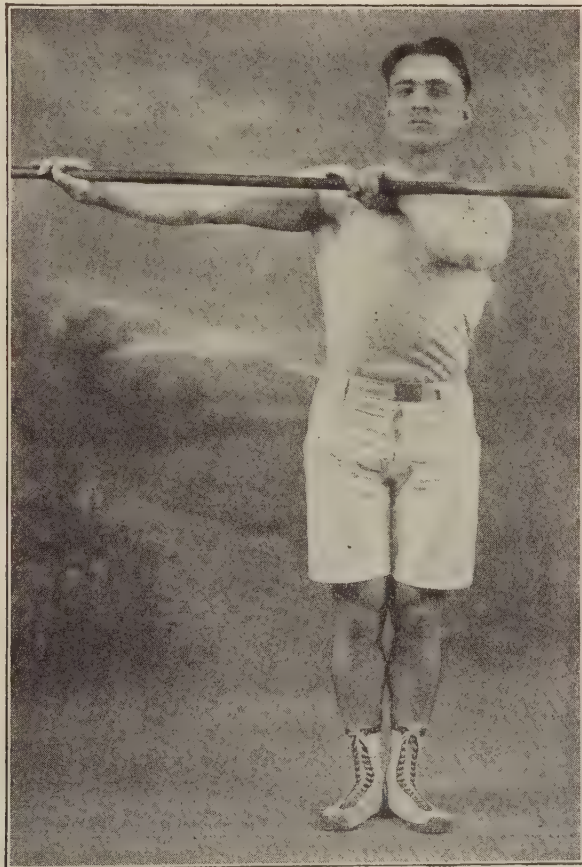
Movement Eleven.—POSITION, ARMS. To simplify this movement, rifle or wand may be held in position illustrated, and at count *One* swung with both arms directly overhead. At count *Two* it may be returned to original position, and the movements continued in this fashion.

Movement Twelve.—SHOULDER HORIZONTAL, RAISE. From position last described, the rifle or staff is raised to horizontal position in front of shoulders, touching chest slightly, then returned to first position, or otherwise at command.

Movement Thirteen.—RIGHT SIDE HORIZONTAL, RAISE. From position in front of shoulders in preceding movement, rifle or staff is smartly thrust to the right, then returned to original position at command.

Movement Fourteen.—RIGHT LOW PERPENDICULAR, DOWN. From position at close of previous movement, bring down right hand, left remaining stationary, so that staff or rifle will be held in vertical position. Return to original position or otherwise at command.

Movement Fifteen.—LEFT

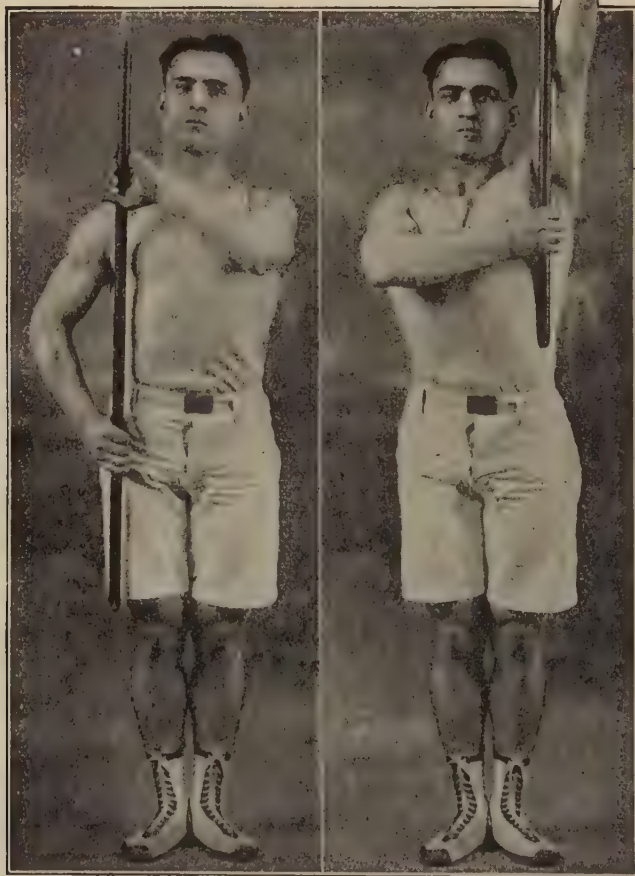


Movement 13. Right side horizontal, RAISE.

HIGH PERPENDICULAR, RAISE. Extending left arm upward, and swinging right arm across chest, bring rifle or staff to vertical position so that lowest point will be just below armpit, returning to position on command.

Movement Sixteen is described by the command upon which it is executed: **LUNGE TO THE RIGHT AND RAISE RIFLE (OR STAFF) TO RIGHT HORIZONTAL, LUNGE.**

Let it be noted that all the exercises described and illustrated in this chapter are chiefly designed to illustrate the manner in which military physical drill is conducted and executed.



Movement 14. Right, low perpendicular, DOWN.

Movement 15. Left, high perpendicular, RAISE.

In the instance of these rifle or staff movements, the exercises shown on pages 663 to 665 of this volume will prove of interest and value.

In the training of the army man, jumping exercises are advocated and find favor as a means of developing agility and other important physical qualities. Breath-

ing exercises are interpolated when helpful and sustaining.

Captain William H. Wilbur, U. S. A., in his helpful work on the Koehler Method of Physical Drill as used by the army, suggests the following allotment of time for daily Setting-up Exercises on the part of trained and untrained men:

	For the trained soldier, entire daily period, 30 minutes.	For the recruit, daily period, 45 minute periods, or two 30 minutes.
1. Preliminary Disciplinary Exercises.....	2 minutes	10 minutes
2. Double Timing	3 minutes	2 minutes
3. Marching Exercises.....	8 minutes	4 minutes
4. Jumping Exercises.....	4 minutes	6 minutes
5. Calisthenics	12 minutes	18 minutes
6. Concluding Disciplinary Exercises.....	1 minute	5 minutes
Totals.....	30 minutes	45 minutes



Movement 16. Lunge to the right, LUNGE.

CHAPTER VI.

GROUP GAMES AND ACTIVITIES.

THE advantages of games and sports that can be engaged in by small and large groups without previous specialized athletic training have long been recognized by those interested in physical culture. Through such games appreciation of the pleasure and profits of exercise may be developed in those who engage in them, and the competitive spirit made to serve a useful purpose for not merely a handful of participants who exhibit their prowess before a far larger group of spectators, but for all of the members of a group, without regard to their skill in specialized athletics.

Great impetus has been given to such group games and activities by the methods by which the millions of young men entering military service during the World War have been encouraged to engage in them. They have served as substitutes for less beneficial, often harmful, amusements these active, adventurous youths might have otherwise engaged in, and at times have also supplemented the more rigorous forms of physical training that formed a great part of military training, and these, taken all in all, have so developed in number and purpose as to give promise of great service in the future task of the civilized world in substituting recreations that actually will re-create for destructive so-called amusements.

The great organization that co-operated with the Government in providing the American Expeditionary Forces with constructive recreation followed the United States Army overseas. The forms of physical recreation which proved most profitable in the training camps were pursued on transports in mid-ocean, at debarkation camps and applied in the most extensive way at camps small and large throughout the training area in France.

The magnitude of the task that confronted the physical instructors and athletic directors engaged in this undertaking,



Troops Passing Basket-ball at U. S. Army Cantonment.

demanded the most effective method of group instruction that could be devised—and this demand was promptly and adequately met.

The games that have been found most effective in Group Activities, as presented here, have been compiled by physical directors, school and college trainers, and by playground directors. They are here classified as Mass Field Games, Line Games, Circle Games, Tag Games, Miscellaneous Games, Rest Games and Strength Tests, the minimum and maximum number of players that may engage in each game appearing before these various groups of activities.

MASS FIELD GAMES.—*The "Shuttle" Method of Group Competition* is so called because competitors are drawn first from one and then the other of the two columns of file in which those engaged are equally divided. The man at the head of one column takes a jump, if this be the event to be contested. His record is marked, and the man at head of opposite column jumps from that point in an opposite direction, trying to jump back to first man's starting point or farther. Opposing teams jump back again in this shuttle fashion until all have com-

peted. If the last man on second team fails to jump to starting point of the man against whom he jumps, the first team is declared victor.

A stationary line such as a tennis tape or plank sunk edge-wise is placed between the heads of columns. It is of advantage to have the shortest men placed at the heads of both columns.

The only equipment required is a permanent take-off line from which events are started, and two sharp sticks to mark progress of contestants in various events.

Here are some suggestions as to the events that may be included:

Standing Broad Jump, Running Broad Jump, Standing Hop, Running Hop, Hop Step and Jump, Shot Put, Three Broad Jump, Backward Jump, Medicine Ball Throw, Football Punt, Football Forward Pass.



American Troops Competing in a Game of "Tunnel," Passing the Medicine Ball.

The Relay Type of Group Contest requires a rather large field for competition, but has the advantage of permitting large bodies of men to engage with practically continuous action.

One hundred men, for instance, may be divided into ten teams of ten men each. Each team quickly arranges itself in column, and the man heading each column jumps as far as possible—if this be the contested event. The second man in each column then jumps in the same direction—in other words relays the first man's jump from the point to which the first man has reached, the column moving up to permit every man to jump in turn. The column covering the greatest distance is the winner. The same equipment as for the shuttle type is adequate, and the same events may be included.

SUGGESTED EVENTS FOR RELAY ATHLETIC MEET.—*Teams Relay.* Competitors are placed at equal intervals in column from five to fifteen yards. The first runner is given a wand or flag. At the signal to start he carries same to the second runner, who carries it forward to the third, and the race continues until the last runner crosses the finishing line.

Standing Broad Jump. All members of each team relay each other to cover as great a distance as they can.

Frog Race. This race is similar to the Team Relay except that the competitors travel forward in frog leaps instead of running. This should be arranged at at least five intervals. The second contestant is tagged off by the first, etc.

Standing Hop.

Leap Frog Jump. The front man in each column assumes a stooping position with hands on knees, toeing the starting line. Number two man takes a run and leaps over number one, resting hands on back during the leap. The point where his heels strike the ground is marked, as in an ordinary jump. He then goes to the rear of the line and the event continues this way until the man who headed the column has taken his leap. Composite distance determines the winner.

Crab Race. This race is the same as the Team Relay with the exception that competitors run on all fours, face up, feet first.

Medicine Ball Throw Back of Neck. Ball is held by both hands behind neck and thrown backward.

LINE GAMES.—In line games the teams, of equal number of contestants, are arranged in columns, or files, not less than ten feet separating these columns. The first man in each column should toe the starting line, all men naturally facing same direction. Another line to serve as a distance line is placed about thirty feet from and parallel to the starting line.

When large numbers compete it is advantageous for the men finishing the relay to wear some distinguishing mark that the judges may quickly discern the winner, though otherwise the last man may hold his hand up as high as possible upon finishing.

Novelty Relay Races.

Minimum number on each team..... 8

Maximum number on each team.....30

Leap Frog Race. (No equipment needed.) Players stand in column, four feet between players. At signal "Ready," all stoop down; at signal "Go" last man takes frog leap over backs of all men preceding him in line and assumes stooping position at head of column. Player at rear end of line then repeats this procedure, likewise the man remaining there after he has jumped over all his column, and so on until every man has jumped. When the man who headed the column has jumped over the backs of his team-mates, he runs forward over finish line, and if he be the first man to reach it wins the race.

Flag Race. (Equipment required: one flag for each team.) All players facing the left, the flag is thrust into ground at the starting line. At starting signal the first man raises flag and quickly passes it to next man in line, who follows suit until flag reaches last man in column, who takes the flag and runs in front of his line to the distance line. Returning to the head of his column, he again passes flag along, and so on until all have run to distance line, in their turn, with flag. The first

team to have the man originally last in its column to reach distance line wins race.

Skin the Snake. (No equipment needed.) With players in regular column file position, each player reaches backward with right hand between legs and grasps the left hand of the teammate behind him, until entire column has joined hands in this manner. At signal to start the last man in the column lies down, retaining firm grip on the hand of man standing astraddle. Entire column, with hands clasped, pass backward over him, ahead of him, and keeping feet together. The man next to last then lies down in same manner, until entire team is outstretched upon ground. The man last to lie down, who



originally stood at head of column, rises quickly as possible and moving forward, straddling the line, pulls the man behind with him so that entire team is pulled to its feet in this manner. The line getting to its feet first, without having broken, wins race.

Wheelbarrow Race. (No equipment needed.) The first man in each column places his hands upon ground. The second man grasps the first man's knees, and supports them on each

hip, forming a human wheelbarrow across distance line.

Centipede Race. (Equipment required: a pole or rope for each team, allowing one foot in length for each man to compete on team.) Players line up stride pole or rope, which must be behind starting line. At signal to start the team runs forward until last man is across finishing line. It then turns about and returns. The race is finished when the last man crosses the starting line.



Rescue Race.

A similar contest not calling for equipment requires that players lock arms around the man in front of them, and keeping step proceed otherwise as in Centipede Race.

Jump Stick Relay. (Equipment required: one stick about three feet long for each team.) The stick is held in the hand of the first man in the column. Upon the signal to start he runs to the distance line, touching beyond line with stick. He then returns to the head of the column and hands the other

end of the stick to number two. Then, holding the stick between them and near the ground, they run to the rear of the column, every man in line jumping over stick as it reaches his feet. Upon reaching the rear of the column, number two takes the stick and runs to the finish line, then returns to starting line and with number three holding other end of stick passes it to the rear of line once more. The game is continued until the last man in line carries the stick across the finishing line.

Rescue Race. (No equipment needed.) At signal number one turns and bending over gets his right shoulder well under crotch of number two, then reaches under it, in front of his body, to grasp number two's right hand, passed over his shoulder. In this position number one can walk or even run while bearing a man larger than himself. After carrying rescued man to distance line, and returning still bearing him, to head of column, he passes to rear of line, leaving number two to carry number three in same manner, and so on until all have taken part in race. Race is won by first team to have the last man in its original column formation to cross finish line.

Monkey and Crab Race. (No equipment needed.) At the signal to start the first man in column places his hands upon the ground and walks to the distance line in monkey fashion. Upon reaching same he assumes a running position and returns to starting line, where he touches number two and then passes to the rear of column. Number two gets down on hands and feet, facing upward, to imitate crab, and walks in this manner, either head or feet first to the finish line, then runs back to touch number three, who runs to line in monkey fashion. The rest of the team continues this alternation, one running face downward and the other face upward, until all have crossed the finish line and returned to starting line, the first team to accomplish this without fouling being the winner.

Paul Revere Race. (No equipment needed.) Players take position in columns in open file order, with fifteen or more feet between players in each column. From each team a slight player is selected to act as rider. He starts just back of the last man in the column. Upon the given signal he leaps upon

the back of the last man, who carries him to the man next in front of him. The rider then must change from the back of the first steed to the back of the second without dismounting or touching the ground. The second steed carries him to the third, and he thus is carried from player to player until he reaches the first man, who carries him across the distance line, and who wins the race if first to finish in this manner.

Dizzy Izzy Race. (Equipment required: one baseball bat or stick of similar length.) At signal, first man in column grabs stick and runs to distance line. As soon as he crosses it, he stoops with stick held to center of his forehead and resting on ground and circles around in this position five times. He then returns to starting line to pass stick to man next in line, who follows suit. This is repeated until all have crossed line and whirled about stick. The first team to have the last man in column originally formed return to line with stick is the winner. Incidentally, the attempt of contestants to keep a straight course when running back to starting line after whirling about stick will be found most amusing.

CIRCLE GAMES.—In circle games, each team makes up a circle by joining hands and stretching back as far as possible, then dropping hands to the sides. Minimum number on each team, 12; maximum number, 50.

Swat Tag. (Equipment required: Swatter, soft shoe, belt or knotted towel.) The players should stand in circle, heads bent forward and eyes on the ground, keeping hands behind backs. The man first "It" runs about the circle with swatter, and secretly passes it to one of the men standing in circle. The man receiving the swatter at once turns upon man at his right and swats him with swatter until the man he is beating can make a complete circle around the outside of his team and returns to his starting position. The man holding the swatter then places the swatter in the hands of some other man, and the game proceeds. The players may not strike others upon the head, the small of the back being the most effective place to use swatter.

Lock Arm Tag. (No equipment needed.) Players are

arranged in pairs in circle. The players in each pair lock the inside arm and place the outside arm on hips. There should be a distance of at least three feet between each pair. Two players are selected of whom one is "It" and chases the other. The man who is pursued can link arms with either player of any pair in the circle, whereupon the player at opposite end of the set of three men is subject to tagging. All endeavor, accordingly, to avoid being joined by the man who is pursued, players being allowed to run through or around the circle in any direction. A man upon being tagged may immediately tag back, but after he is attached to any other player may neither tag nor be tagged, unless a third player joins them.

Three Deep Tag. (No equipment needed.) Players are arranged in pairs, but with each two players standing, one in front of the other, instead of side by side. The game proceeds as in Lock Arm Tag, except that when the man pursued stands in front of any pair, the third man on the outside is subject to being tagged when the pair to which he belongs becomes "three deep."

Broncho Tag. (No equipment needed.) Players are arranged the same as in "Three Deep." The outside man of the pair grasps the man standing in front of him by the waist, and by twisting him about tries to prevent the man who pursues him from tagging his fellow player. The front man tries to catch and hold the man who is pursued, that he may be tagged instead of the man in front of whom he tries to stand. If the man pursued does manage to stand in front of any pair, the outside man may be tagged by the player who is "It."

Pull Into Circle. (No equipment needed.) After a small circle is marked upon the ground, players are arranged around the circle facing in with joined hands. At the signal to start, the men try to make some fellow players step inside of small circle with one or both feet. If this occurs, that player drops out. In team competition, the team that eliminates the most men in a given time is declared winner.

Channel Tag. (Equipment required: medicine ball, basketball or some other object readily passed, for each team.) Play-

ers, arranged in circle, face to the right, assuming stride-stand position. One player is made "It" and as ball or other object is passed between the legs of the men in the circle, he tries to grasp ball. If he succeeds, the man who touched it last before him becomes "It" as penalty, the man formerly "It" taking his place in the circle. The ball may be passed either backward or forward.

Breaking Prison, Bull in Ring. (No equipment needed.) Players are arranged in a circle with hands joined. The prisoner takes his place in the center of the circle and tries to get out by breaking the bars (clasped hands) or by going over or



Ankle Tag.

under these barriers. Should he escape all other players give chase. The one catching him becomes the prisoner. Prisoners are not allowed to rush more than two strides in attempting to break through the line.

Mount Ball, Rider Ball, Broncho Ball. (Equipment: one basketball.) No. 2s mount astride the backs of No. 1s and are given the basketball. The riders endeavor to pass the basketball back and forth. The players they are riding (the bronchos), endeavor, by jumping and bucking, to cause the riders to miss catching the ball. If the ball is dropped upon the ground, the broncho of the player that dropped the ball picks it up and endeavors to hit the rider with it. (Caution—bronchos should keep their positions in the ring. The riders are free to run anywhere to avoid being hit.) If he succeeds, then the riders become the bronchos and the bronchos are given the ball and the game proceeds as before. Heavy men should be paired together in this game.

TAG GAMES.—In Tag Games the minimum number on each team is 6, while the maximum number is 50.

Ankle Tag. This game is similar to "Mount Tag" with the exception that a man to escape being tagged grasps another man by either ankle. The man whose ankle is held, however, is liable to being tagged unless he has hold of someone's ankle.

Ostrich Tag. In order to be safe the player must be standing on one foot with opposite arm under knee of same side hand grasping nose. This may be made more vigorous by allowing the one who is "It" to take one push at any man in this position and if he breaks his position he is subject to being tagged until he again assumes the position.

Marching Tag. Two base lines, 50 feet apart. The group is broken up into two units. These units form in company fronting behind their base line, facing each other. Unit No. 1 marches forward in this formation and continues so to march until a whistle is blown. The whistle is the signal for No. 1 to break ranks and run back to their base line before the men forming Unit No. 2 can tag them. No. 2 man can not leave their base line until the whistle is blown. Every man

tagged before crossing his base line must line up with No. 2. Unit No. 2 then marches forward until a whistle is blown and is chased back behind their base line by group No. 1. The line having the largest number of players after an equal number of trials wins the game.

Turtle Tag. May be played as circle game or otherwise, provided game is kept within suitable boundary space. When pursued by man who is "It," players may gain immunity by dropping to the ground, upon their backs, with feet and hands held upward, turtle fashion. Once out of this position they may be tagged. The man who is "It" has the privilege of running away for four paces and returning, and if the man on ground cannot in that time rise and again resume turtle position, he is subject to pursuit and tagging.

MISCELLANEOUS GAMES.—In the following games the mini-



Turtle Tag.

mum number on each team is 8, and the maximum number on each team is 200.

Line Wrestling. (Equipment needed: one line marked upon field.) Teams line up on each side of the line, facing each other. Object—to pull the opponent across the line. At the command to go, the men try to pull opponents across the line. When both feet of a man cross the line he becomes a captive and is out of the game for that trial. The team which has succeeded in pulling over the most men at the end of two minutes wins. The best two out of three pulls, to determine the best team.

Battle Ball. (Equipment needed: basketballs and medicine balls. Two lines parallel and 5 feet apart.) Competing teams line up behind the line facing each other. A number of basketballs and medicine balls are distributed equally among



Line Wrestling.



Team Ready for Mount Wrestling.

the two teams. At the signal to go, the balls are thrown at members of opposing team. If a ball touches the individual or if the individual tries to catch it and misses it, it counts a hit for the other. Only one player can be hit at a throw. The team that succeeds in making the most hits during a play period wins the game.

Taking the Trench. (Equipment needed: two parallel lines, about ten feet apart.) The defenders line up on one of the lines with their backs toward the other line. The object of attacking team is to break through the line formed by the defenders and cross "No Man's Land," which is the space between the two lines. As soon as they have crossed the second line, they have taken the trench and can no longer be molested. The defenders endeavor to frustrate the attackers by holding or pushing. (Holding by the clothing is not allowed.) Two minutes is allowed for a try. Every man who has crossed the second line before the two minutes are up, in tending the goal, counts one point for his team. In the second charge, No. 1 changes places with No. 2.

Mount Wrestling. (No equipment needed.) Competing teams divide according to size. The heavy men carry the lighter men astride their backs. At the signal to go, they meet their opponents who are in a like position and the rider endeavors to dismount as many of the opponents as possible. A dismount is determined when one or both feet of the opponent touches

the ground. The team having the most men mounted at the end of a period of play is the winner. Holding by the clothing is prohibited.

Scrimmage Ball. (Equipment needed: one basketball or medicine ball, two goal lines about 40 yards apart and 20 yards long. Side lines to connect the ends of the goal lines forming a rectangular playing space.) The game is started by a forward from each opposing side placing one hand on the ball at the center of the field. Opposing players line up behind their own goal line. Each team is divided equally into forwards and guards. At a signal from the referee the two opponents at the center of the field start playing the ball and the forwards from each team rush into the playing space. The object of the game is to hit the ball with one hand, causing it to touch the ground behind the opponents' goal line.

Foul: It is a foul to hit, push or tackle an opponent, to use both hands on the ball, to throw, kick or block the ball with any part of the body except the hands, to hit the ball while kneeling or lying upon the ground.

Penalty for Fouls: The penalty for a foul is a free try for the goal from behind the penalty mark which is 15 yards in front of the goal line. One of the offended side tosses up the ball while a team-mate endeavors to hit it over the goal line before it touches the ground. Players of the offending side must line up behind the goal line.

Scoring: If the ball touches the ground behind the goal line it counts one goal and two points are recorded. A foul goal counts one point.

Time: Game shall be played in two halves of ten minutes' duration. *Rules.* There is no off-side play and no out-of-bound. Goal tenders must remain behind the goal line and in tending the goal are allowed to place one foot in front of the goal line. If they step over the goal line with both feet it constitutes a foul. After each goal the forwards become guards and the guards forwards. The ball is placed in the center of the field and play continues.

Steal the Flag. (Equipment needed: two base lines, par-

allel and 50 feet apart. A small stick two feet long, which may have a flag attached if desired.) Players on opposing team line up behind the two lines facing each other. A captain is elected. Each team sends out one representative to the center of the field where the small stick has been stuck into the ground in a vertical position. The object of the two men who have been sent to the center is to grasp the flag and get away behind the base line before he can be tagged by the opponent. If he succeeds it counts one point for his team. If he is tagged by his opponent, it counts one for the opponents. Either man has the privilege of grasping the stick and attempting to return with it to his line. The stick is immediately stuck up in the center field and each captain selects another of his team to send forward to capture the stick the second time. Game continues until each man has had equal opportunity to steal the flag.

Rope Rush. (Equipment needed: 1½-inch rope, 20 feet long, 2 base lines, parallel with each other and 50 feet apart.) Opposing teams line up behind the base lines, facing each other. The rope is placed half way between the lines in a pile on the ground. At the signal to start, both teams rush forward and try to get the rope back behind their base lines. The team that succeeds in doing this wins the game.

Black and White. (Equipment needed: two base lines, parallel with each other and 50 feet apart, a center line parallel with the base lines and half way between, a pasteboard or wooden disk about 4 inches in diameter, white on one side and black on the other.) Players on opposing teams line up back to back on each side of the center line with a space of 6 feet between the lines. One team is called "White," the other "Black." The disk is thrown into the air by the official. If the white side turns up, the "White" team chases the "Black" team across their base line. Every man tagged by the "White" team men, joins the "White" team. The two teams line up as before, the disk is again thrown and whichever side comes up, that team endeavors to tag its opponents before they can run across their base line. The team having the largest number of players at the end of a game, wins.

Mass Soccer. (Equipment needed: four to eight soccer footballs. Number of balls determined by number of participants in the game. Game is played on regular football field.) Players on opposite team line up facing each other and 10 yards apart at the center of the field in lines parallel to the goal line. The balls are placed on the center of the line on the field between opposing teams. At the signal to start the opposing teams rush forward and endeavor to kick the balls across their opponents' goal line. The same rules which applied to soccer football as to personal contact and as to playing of the ball, apply here. If a team succeeds in kicking one of the balls across their opponents' line, it counts one point for that team. If the ball crosses the goal line between the goal posts, two points are accorded the team. In either case that ball which has been kicked across the goal line is brought to the center and kicked off again by a player of the team scored against. The game continues until all the balls have been put out of play, each having been kicked across either of the goal lines. If the ball has been kicked outside of the field of play, the referee blows his whistle. He then picks up the ball and throws it into the field of play at the line at right angles to the side line and for a distance of at least 10 feet. It is necessary to have as many officials as there are balls. A foul is penalized by giving the opposing team a free kick at the point where the foul was committed. The defending team must keep at least 10 feet from the ball during the free kick. Exception—if the ball is nearer the goal line than 10 feet, the penalized team may line up half way between the ball and the goal line. There should be a judge for each ball and a scorer on each line. A judge shall report to the scorer whenever a goal is scored by the ball he judges. There shall be a referee who shall have the same authority as the referee in soccer.

Tug-of-War. (Equipment needed: 1½-inch rope, 60 to 100 feet long. The center of the rope is marked by a tape or string. Six feet on both sides of the center the rope is marked by other pieces of tape.) Opponents are lined up at each end of the rope (they are not allowed to grasp it beyond the six

foot mark, nor are they allowed to tie it about their bodies.) The center of the rope is placed over a mark on the ground. At the signal to pull, the teams endeavor to pull their opponents across the center line. If before the end of two minutes a team has succeeded in pulling the rope so that the six foot tape on their opponents' side of the rope crosses the center line, that shall count as a victory for that team and pull ends.

Cane Rush. (Equipment needed: a number of small sticks or short pieces of rope about 3 feet long, two base lines, 50 feet apart.) Opposing teams line up beyond the base line, facing each other. The short canes or ropes are placed in the center of the playing space half way between the two base lines. At the signal to start both teams rush forward and endeavor to bring as many of the canes or strings behind their base line as possible. At the end of playing time, the team which has succeeded in bringing the most of these home, wins.

Dual Wrestling. (No equipment needed.) Teams line up for dual competition with a short man in front of the column. Arrange men in columns with not over ten men in each column. The first man in the column steps out and wrestles, endeavoring to make his opponent touch the ground with some part of the body other than the feet. If he succeeds it counts one point for his team. The two men take their places at the rear end of the line and the second two men step out and wrestle. This is continued until all the men have competed. The team having the largest number of points at the end of the contest wins. (Winners in each column can be matched in a final if desired.)

Push Across Line. (No equipment needed.) Two lines about 20 feet apart. In the center of the lane thus made the two teams are placed in line facing each other. At the signal to go each man tries to push his opponent back and across his opponent's line. At the expiration of one minute, time is called and the squad having pushed the largest number of its opponents across the line wins.

REST GAMES.—These games may be used between strenuous active games for the purpose of resting the players. The game can also be used indoors as a means of social entertainment.

Buzz. (No equipment needed.) Players are grouped around the leader in a ring. The leader has the players start counting. If it becomes the player's turn to count seven, some multiple of seven or a number with seven in it, that player must say "Buzz" instead of the number. The penalty for not doing this is dropping out of the circle. The counting will continue so long as there are players in the game.



Hand Wrestling.

"Kelly Says." (No equipment needed.) The players are grouped about the leader or in military formation. The leader gives the commands, preceded by the words "Kelly says." Example: "Kelly says, Right Face; Kelly says, Be Seated." If the leader leaves out "Kelly says" before any of his commands, the command is not to be executed. The player answering such a command drops out of the game. This game is very popular with soldiers and can be used with the manual of arms.

Passing the Buck. (No equipment needed.) The players are in formation of two or more files, standing at stride-stand



Twist Stick.

position with forward body-bend and hands upon hips. Upon the starting signal the back man comes to the position of attention—with a snap—at the same time striking hard with the open palm of both hands the seat of the man in front of him, who in turn “Passes the Buck” on down the file. When the file-leader receives the “Buck” he immediately gives the command, “about face”—the file about faces and jump to a stride—stand forward trunk-bend and the “Buck” is then passed up the file harder and faster than it went down. This is a relay race and the file getting the “Buck” back to its file-closer first, wins. It is advisable to repeat the relay, i. e., have the “Buck” passed down and up the file twice.

STRENGTH TESTS.—Large groups of men can be divided into equal smaller groups and compete in the following events to good advantage. These events can also be used successfully as events for stunt night programs. Have the winner challenge anyone in the audience.



Hand Wrestling. (1) The wrestlers stand with right foot advanced clasping right hands. The object is to make opponent move a foot from its position, on the ground. This constitutes a throw.

Toe Wrestling. (2) The wrestlers are seated on the ground facing each other. A stick is placed between the arms and knees while in this position. The object is to get the toes under those of the opponent and roll him over backwards. If either wrestler breaks his hand clasp about the knees it constitutes a victory for his opponent.

Indian Wrestling. (3) The wrestlers lie upon their backs, side by side, with arms locked, legs extended in opposite directions. The right legs are raised and lowered twice. At the third raising they lock legs together and each endeavors to bring his opponent's leg down to the ground thereby turning him upon his face.

Pull Stick. (4) Two sit upon the floor, toes against toes. They grasp a broom handle between them and at the signal each tries to pull the other up off the floor. Can be used without stick by opponents grasping hands, using the hook grasp.



Pull Stick.

Twist Stick. (5) Two grasp a gun or broom handle high above their heads. At the word to go the stick must be brought down between them, thereby twisting within the hands of one of the players. This can be done without stick by having opponents grasp hands above head, fingers between fingers.

Cock Fight. (6) A circle four feet in diameter is drawn upon the floor or ground. Two players standing on one leg, both hands grasping the other foot behind their backs, endeavor to make the other step outside of the ring or break his clasp upon the up-held foot, by shouldering each other.

Dog Fight. (7) Players, in pairs, place themselves on hands and knees facing each other about three feet apart. Their leather belts are linked together. The linked belts are thrown over their heads. The players must keep heads up and back. At the word go, the players pull against each other until one of them is pulled across the line, three feet back from where the players started, or until his head is pulled forward, thereby releasing the strap.

CHAPTER VII.

PHYSICAL TRAINING FOR WOMEN.

ALL that has been said throughout this entire work in regard to the value and importance of bodily strength and all-round physical vigor, applies as much to women as to men. Indeed, one may say that physical strength and rugged health are, if anything, even more important in the case of the so-called weaker sex, because of the heavier burdens which women have to bear in the natural course of life. It is true that these burdens are not always in evidence in the case of those supposedly fortunate but truly unfortunate women who live the pampered, parasitic existence of idle and luxurious wealth. But for the average housewife and mother, whose labors are not limited by special working hours, as in the case of the father of the family, these burdens are such as to demand the most perfect physical condition. But more than this, since woman bears the children, the very life and energy of the race depends upon her and her health. From a vital



Photo by Underwood and Underwood.

Six members of the United States Olympic team at practice just before sailing for Europe for the last International Contest. Note the sensible type of costume the girls are wearing.

and biologic standpoint, therefore, we can least of all afford to neglect the question of the health and physical development of women.

The day has gone by when it was considered that frailty, either in a physical sense or in its reference to character, was the essential quality of womanhood. We know now that the designation of the "weaker sex," as applied to women, was an unpardonable libel against the sex which there is good reason to believe is the more vital and enduring of the two. We know now that the apparent and superficial muscular weakness of woman has been the result of artificial conditions which have been forced upon her, and that the old conception of her was a result of the general misunderstanding of this fact. We know now that when placed in a natural environment, with the possibility of full development, woman is no less strong and enduring than man, a fact which has been amply proved by the physical stamina of women in various savage tribes where conditions have favored something like equality of development.

We know that in spite of the physical handicaps which women have endured in the past, and the burdens which they have carried, probably a larger number of them have lived to extreme age than of men, indicating their innate vitality and power of endurance. And from a biologic standpoint we should really expect this to be the case. Scientifically speaking, the female was the only sex in the beginning, and for a long time the only sex, Nature apparently intending that it should be the predominating sex at all times. The male spider is insignificant in comparison with the female, both in strength and size. It is so with many other insects. Among most species of fish the female is the larger and better developed. The female eagle is more powerful than the male. Among most animals, it has been the tendency of the males to fight for the possession of the female that has gradually developed in them a superior muscular strength. In the human race, artificial conditions and the perverted ideals of womanhood which have endured for a long time have been responsible for the

superficial feminine weakness of the past. Even in spite of this, and without the advantage of the physical training which women have taken up in recent years, many women have at various times demonstrated their physical fitness to cope with men in their own specialties. If it is true that Irishmen make splendid policemen, then it is also certain that in some cases their wives would prove even more efficient in that line of work, at least when their pristine vitality is as yet unspoiled by American habits and perversions.

But the athletic girl is fast becoming the ideal, and the world generally is gaining a more wholesome conception of the meaning of perfect womanhood. Both men and women are learning that the subtle charm of womanhood is the result of the superb physical magnetism of robust health, and that without this vitality, this physical basis of true womanhood, no woman can be more than half of her real self. Furthermore, women are coming to realize that exquisite personal beauty is almost entirely a matter of health and development. Beauty is the expression of a vigorous and harmonious condition of the entire body, of internal cleanliness and wholesomeness, all of which are absolutely inconsistent with a condition of weakness or the physical inactivity which is responsible for



Front and back views of a ten-year-old girl, illustrating the grace and symmetry of the female form, even when a muscular development has been attained.

Photographs of Miss Margaret Claire Edwards, of California.

such weakness. Pure blood and a good circulation are impossible under conditions of muscular stagnation, involving also a lack of tone and the sluggish action of the functional organs. The beauty lines of any part of the body depend upon the muscular efficiency of that part. If muscularly strong and competent, the lines will be those of grace and symmetry. If weak, awkward and incapable, the lines will be those of ugliness. It is the muscular formations underneath the skin which give character and contour to any part, the decided muscular structure merely being smoothed off by a superficial deposit of fat. A body formed chiefly of fat, and lacking in the substructure of muscle, is flaccid, shapeless and altogether ugly, and cannot possibly be otherwise.

This chapter is intended to take up matters of special interest in the physical training and development of women, with some special exercises of peculiar value to the sex. However all that has been said elsewhere in regard to exercise and its essentials applies to women as well as to men. The class drills and calisthenic exercises offered in another place are recommended for the uses of women as much as for men, and will prove adequate for all purposes of general development.



Photograph, Paul Thompson, New York.

It is an error to suppose that girls are debarred from participating in field sports.

The various subjects treated here are taken up in alphabetical order so far as this is practicable.

CARRIAGE, GRACE AND POISE.—The importance of an erect carriage and of good bodily poise cannot be overestimated, and especially so in the case of women, among whom the consequences of poor carriage and the concomitant prolapsus of internal organs are much more serious than in the case of a man. The human body is built along such lines that it is properly efficient and at its best only when it is erect. Any deviations from the correct attitude inevitably lead to derangements or disorders detrimental to the entire body.

It may be said that the first essential for securing an erect carriage is a high degree of vitality and vigor of the entire body, and of the back especially. It is the muscles of the back which are directly and immediately concerned in maintaining a normal position of the spinal column, and for this reason I would especially urge upon all women readers to adopt special



Photograph by Wide World Photos.

A schoolgirl taking a high jump of four feet and seven inches in an intercollegiate athletic meet.

exercises for strengthening the back. I urge this not only for the sake of the special development of the back muscles which is important enough, but also because of the influence of exercises for the back and of strength in this region in invigorating the spinal cord and energizing the entire nervous system of the body. And as I have just said, it is this vitality, this constitutional vigor, which is the first essential of a good carriage.

It is sufficient to look at any one who has a surplus of vital energy, who carries about with her the suggestion of reserve power in abundance, and who is magnetic and commanding in personality because of this physical energy and vitality, to note the effect upon the carriage of the body. In her exuberant health you will see that she stands erect, that she holds her head up with an unconscious grace and strength, that her bosom is high and full, and that she treads the earth with a step so light that it would seem that she weighed nothing at all. On the other hand, note the languid attitude of the sickly one, the natural attitude, without the support of corsets and braces which hold her stiffly and awkwardly almost erect. Her entire upper body is in a slump, with drooping, perhaps rounded shoulders, chest contracted, the naturally beautiful arch of the back almost straight, the abdomen protruding and all of the internal organs sagging



Eight wholesome young women whose vigorous bodies and graceful movements clearly indicate the benefit they have secured from this splendid exercise.

inches below their normal position. Her entire physical attitude is suggestive of her lack of vigor: is a concrete expression of her physical self. It is not sufficient in her case to suggest that she stand erect, and it is not even sufficient for her to take one or two special exercises for improving her carriage, though such exercises will accomplish much; but in order to enjoy a perfect carriage and that exquisite physical poise which means charm and grace, she must build health and strength of the body in every way. She must acquire that superb degree of vitality which in the case of the other woman expresses itself unconsciously in the grace and poise of an erect but easy carriage.

If the reader will refer to Volume I and to the chapters on the construction of the human body, it will be observed that the organs lie close together, some entirely surrounded, others bounded by the diaphragm, the ribs, the walls of the abdomen, or by the pelvis; several of them are suspended from the spinal column. The organs are many, because the various processes necessary to conduct properly the various functions of so complex a mechanism require such a large number; they are closely compact because of their necessarily limited space and because their functions are so closely interrelated. Yet, when the spine is erect and the trunk free from constrictions, they have ample room.

An automobile, or a watch, or any other piece of machinery will not continue to function properly if one side of it "buckles"—if it is folded upon itself. The human machine is composed of fairly soft structures, it is true, but these structures cannot function much more effectively than can the various parts of the other machines when they are pressed against one another and squeezed against restraining walls. But this is exactly what one does when he slumps or fails to hold the body erect: the organs are crowded into still smaller space. They are normally prepared to do their very best work only when in their natural positions, and the crowding and straining which they endure in a prolapsed condition interfere most seriously with their duties, as well as with the circulation of the blood through them. And to a very large extent the multifarious weaknesses

and disorders peculiar to the female sex are due directly to the weakness and prolapsus which follow improper carriage, when the corset is not also a contributing cause or even a more prominent cause. In thousands of cases a vigorous and erect carriage would enable women to avoid these difficulties, provided also that they did not injure themselves with corsets.

The corset, indeed, must be blamed in many cases for the special weakness of the back which makes good carriage and poise impossible. Women who have a sense of "style," which really means grace of bearing rather than the fashion in garments, appreciate the beauty of the erect carriage, and in their endeavors to realize their ideal they foolishly depend upon their greatest enemy, the corset, to hold them erect. They succeed in keeping themselves erect, and yet they do not succeed in their desire, for their attitude is a stiff one; it is without life, without grace, without that suggestion of physical poise and vigor which gives an irresistible charm to the woman who is truly vital and magnetic. The corset does not and cannot take the place of good strong muscles and the sense of energy throughout the body, which makes for grace and poise. The bearing of the corseted woman has none of that elastic, resilient quality which in the case of the other woman expresses life. In the one case you see the outlines of a stiff steel or whalebone box, an inanimate thing; in the other, a human body, lithe and alive, the most graceful and beautiful of all the creations of earth or sky.

Just as a condition of weakness and ill-health results in a poor carriage, so does a negligent and careless attitude react upon the health to make it worse. And just as a condition of physical vigor expresses itself in an erect attitude, so does the latter tend to encourage and develop vigor, because of the advantage under which all of the functions and activities of the body proceed. There is less fatigue, with a conserving of the vitality which is otherwise needlessly wasted. Therefore, every woman should make a special study of the requirements of good carriage, and should keep to the erect form in sitting, standing and walking. It is really no harder to sit and

stand properly than improperly, and if you think it is, then you have not the proper poise. As soon as you are accustomed to this, you will find it easier than the incorrect attitude, and you will be able to do much more work with less effort. Remember that there should be no strain in any part. Do not go about continuously trying to pull your shoulders too far back, and do not make the mistake of pulling the shoulders upward; they should be back, but *down*, and this will have the effect of raising the chest, also keeping the abdomen within proper bounds. It needs hardly be said that a vigorous condition of the muscles of the region of the stomach and pelvis will help materially in maintaining a normal attitude of the torso, but one should give special attention to the development of the back, shoulders and chest.

High-heeled shoes have been referred to elsewhere, but I mention them again because of their special influence in disturbing the proper carriage of the body. Their tilting up influence throws the entire upper body out of plumb. The original construction of the feet by Nature cannot be improved upon, and the nearer we get to the flat heel of the moccasin the better for good carriage.

All general exercises which develop the body and train the muscles are of indirect value in improving the carriage and in promoting grace. There



An illustration of the prolapsed condition of the abdomen, caused by corsets and constricting garments. Note the scars on the skin of the abdomen caused by corset-wearing.

is one very simple exercise which I am presenting here, however, which is of unusual value in restoring poise if one has become careless in her attitude. This exercise may be executed at any time of the day at which you may think of it and will leave you with a sense of vigor in your attitude. It raises all prolapsed parts

of the body to their normal position, where they may remain. The essential thing is the stretching high above the head shown in the illustration, arching the back, elevating the chest, and drawing in stomach. Returning hands to sides, you will find that you will continue to stand in the ideal attitude, expressive of poise and grace, and of vigor as well.

Sitting correctly is just as important as standing properly and this exercise may be executed sitting down equally well, and with the greatest advantage. In each case the important thing is the upper body, or torso, and the general attitude of this should be the same in sitting as in standing. The exercise mentioned will enable one to get it, though it may be said that it will often help if one foot is drawn back under the chair and the other extended a bit forward on the floor. In this position of the feet you will be able to arise and sit down without bending far forward.



A simple but ideal exercise for securing and maintaining poise and good carriage. First stretch the arms high above the head as in the photograph to the right, stretching upward vigorously, till the back is arched and the chest high. Then, with elbows pulled back all the way down, draw hands down to the shoulders, head back, as in the photograph to the left. Now, retaining the general position of the body, return hands to sides, and you will find yourself standing perfectly, releasing any sense of strain. Note especially the proper curve of the back in this illustration.

It should be remembered that the spinal column is not straight like a broomstick, but that it has a decided arch inward at the small of the back. Much is said about a "straight back," but the expression has reference to a back that is not humped or rounded at the shoulders, and in strapping his pa-poose to a board it was the idea of the American Indian to avoid such tendencies. The arch of the back referred to aids in giving the spine its elastic or spring-like quality, and helps to take the jar of walking or jumping away from the brain. Indeed, the spine has a double arch, another at the upper part, the entire line not unlike that of a letter "S" with a modified curve. Now, in either sitting or standing, if the lower part of the back is straight, the chest is necessarily thrown forward and depressed, while the abdomen is thrown



Trans-Atlantic Co.

A suitable protection against cold for outdoor games in winter. Note the heavy woolen cuffs for protecting the wrists.

forward and upward, the whole attitude being ugly and unhealthful. With the back arched inward, both chest and abdomen take their proper places, and the general lines are those of beauty. This position should not be exaggerated, but if one will think of the small of her back when sitting and see that it is properly arched in this way, she will find that her chest will take its proper position, and that the entire body will have an erect, graceful carriage.

DANCING.—Dancing is an ideal exercise for women, when practiced under wholesome conditions and in well ventilated rooms. This applies particularly to those forms of fancy dancing and folk dances which involve a certain amount of real action.

The ordinary dances of the ballroom cannot be so much commended because of the unsatisfactory conditions under which they are carried on. There was a time when dances of this kind were carried on at picnics in the open air, often upon very crude platforms or improvised floors, and under such circumstances nothing better could be devised for healthful and strength-building pleasure. A revival of such customs would be a thing to be welcomed gladly. As an exercise, pure and simple, the ballroom type of dancing is very satisfactory and beneficial, even though not so well suited to purposes of development and strength-building as fancy dancing.

As commonly practiced at the present time, however, ballroom dances must be condemned for two important reasons—first, that they are practiced only in the late hours of the night, and, second, because they take place only in crowded rooms. There is usually some attempt at open windows in the ordinary ballroom, in response to the purely instinctive demand for air, but when a place is crowded with

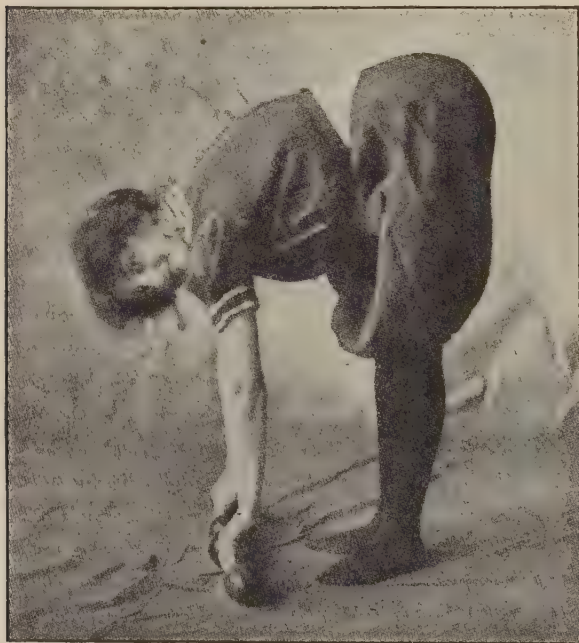


The clean-cut lines of Annette Kellermann, a champion woman athlete, and holder of numerous world's swimming records. An example of perfect womanhood in real life.

young people engaged in this exercise, and consuming many times more oxygen because they are engaged in exercise than they would in a state of rest, two or three open windows are far from sufficient to answer all demands. And sometimes they are not opened until late in the night, when the air has become too heated and foul for further endurance.

Unfortunately, the custom has arisen of going to dances late. It has actually come to be thought bad form and most unfashionable for a couple to arrive at the ballroom before half past nine or ten o'clock. At that rate, one simply cannot attend a dance without a serious loss of sleep, and the matter of losing sleep is a most vital one.

DRESS AND EXERCISE.—The requirements of healthful exercise, as well as the conditions of every-day life, demand some radical departures from many of the conventional styles of clothing. These necessities are to a certain extent recognized in connection with sports and outdoor pastimes, though the rational modifications of ordinary wear are not adopted ex-



One awkward difficulty which is avoided in the one-piece gymnasium suit. In spite of precautions, the stretching of the back sometimes produces this result.

cept by a few intelligent and sensible women. It is the desire here to offer a few suggestions as to dress both for the special purposes of exercise and for attire in the street and home which will allow comfort and freedom for the body and at the same time conform reasonably to the conventions of the time.

It is needless

to say that for purposes of exercise it is necessary to have clothing which permits of the most absolute freedom of movement in every part of the body, and for this reason neither the corset nor the long skirt can be tolerated. Even the divided skirt, which was formerly adopted extensively in the riding of the bicycle and on horseback, did not answer to all of these requirements, though an undoubted improvement upon the old-fashioned skirt. The form of the knickerbocker or bloomer, therefore, has come to be universally used in gymnasiums for young women.

At the Olympic Games held in London in 1908 there was a large group of girl gymnasts from Denmark, taking part in the games, and giving some exhibition gymnastic drills. Their costume was a most interesting one, inasmuch as it consisted of a blouse and a short, divided skirt, with bloomers worn underneath. This short skirt was fairly full, and reaching only to the knees was not open to the objections to the longer skirts used in cycling and on horseback. The costume proved to be a very becoming and attractive one, without interfering in the least with any movement of the body.

Some recognition is also given to the requirements of the body in the construction of bathing suits for women, inasmuch as a short skirt is



A unique and serviceable combination bloomer suit. May be worn with a guimpe, and with a loose girdle attached to the back, which may be buttoned in front. There can be absolutely no constriction of the waist in this suit and no "coming apart."

provided, with bloomers underneath. But so long as the bloomers are worn, the short skirt is wholly superfluous and only serves as a burden to the bather. The proper bathing suit for a woman, if she is not so secluded as to wear tights or trunks, is a very simple blouse and bloomers, or better yet, a combination of the two in one piece.

We are presenting herewith an illustration of a unique and very satisfactory combination suit for the gymnasium, constructed somewhat after the plan of a "Princess" garment, but with bloomers taking the place of the skirt. It requires very little goods, comparatively, and may be made without sleeves, low in the neck with straps over the shoulder in such a way that it may be worn with a simple guimpe. A loose girdle may be attached to the back and buttoned at the front, dropping down two or three inches, and conforming to all of the movements of the body.

One of the advantages of this costume is there is absolutely no band or constriction of the waist, not even to the extent of that which ordinarily supports a pair of bloomers. In the ordinary blouse and bloomer costume there is always some danger of their coming apart at the waist line, as is shown in another illustration of a gymnastic girl bending over to the floor, but in the case of this excellent little garment the mind of the wearer can be absolutely free of any worry on this point.

Any dressmaker should be able to design and make this costume after seeing the picture, making any variations desired to suit individual taste.

For outdoor sports and games the same necessities for freedom of action prevail, making the skirt a hindrance and a nuisance.

The skirt is really a most irrational form of attire any way, under all conditions, being unsanitary as well as interfering with one's movements. The ordinary long skirt sweeps up the dirt of the street, brings it into the home, and shakes it out again into the lungs of those in the house. It is an economic waste of material and an abomination in housework.

Fortunately, the good sense of women has brought about a reform in the style and character of the skirt now worn on the street, in the office, in the home, and at play and recreation. The long skirt is passing, the only exception being in evening costuming, and even here the short skirts are the more popular.

The long skirt in the home or office is an utter abomination, just as it is in outdoor sports. The shorter style is more becoming in every way and gives to women an ease and grace in walking that is appreciated by all.

The increased number of women who have taken up "hiking" as regular form of exercise has brought about a different type of costume for this purpose—a style of dress something like men's trousers but shorter, which come to a point just below the knee. These knickerbockers or "knickers" as they are popularly called are a very sensible form of clothing and may be worn during any part of the year.

This costume may be used in walking, hiking, skating—for exercise in any form; and not infrequently knickers are seen on tennis courts. The short skirt is still most in evidence on the tennis courts, but it is made of light material and if given sufficient width at the bottom will cause no inconvenience in playing this game.



Photograph by Wide World Co.

An ideal costume for walking and for other forms of outdoor exercise.

Along with the knickers may be worn woolen stockings and a soft hat. A loose blouse is of course best, of heavier material in winter. For late fall and winter walking a woolen outing skirt may be worn. All in all, as a costume for women, I feel quite sure that there is nothing so graceful, so practical and so sensible as khaki knickerbockers and a loose comfortable blouse for "roughing it" in the country or along country roads.

Male athletes use a form of clothing best suited to the purpose of the game or sport. Thus the base ball player has his own type of uniform, cut to the knee, with stocking of proper material; the foot ball player uses short padded pants and shirts, and the tennis player a loose, long style of trousers



A simple costume that is artistic and comfortable. In no way does it conflict with true fashion or with the free movement of the body.

or linen knickers; for track, running trunks are preferred, and for bathing, a suit of scant design that offers little friction in the water. If men will adopt styles of clothing best suited for their requirements for work and sport, why should not women? The best answer is—they do!

Artistically speaking, the waist line is a monstrosity. There is no such thing as the waist line in the anatomy of the human body. Where a girdle is desired, in some part of the garment, the proper place for it is directly underneath the bust, and this is where the art and beauty loving Greeks placed it, allowing

for the free and beautiful flow of drapery below this point. For those who love the lines of drapery it should be evident that there is no opportunity for satisfaction in this regard in a skirt which is pulled in tightly around the waist.

In order to do away with the waist line in the external garments, and also to avoid any constriction of the body, all underclothing should be designed to hang from the shoulders. Garments of this kind are coming to be used more and more, and may be purchased ready made in large varieties and selections, under the name of union or combination garments. One may secure combination chemise and drawers, combination corset-cover and drawers and combination waist and petticoat. Such garments are now available in nearly every store giving attention to women's wear.

Provided with a foundation of this kind, one may then proceed with external garments of a suitable nature, eliminating the waist band and the waist line entirely. But if one has a good figure, as she should have and can have in a short time by diligent application to the necessary exercises, it is also possible to follow the styles which call for separate waists and skirts, though for this purpose an underwaist which fits perfectly, but not tightly, should be devised and used, so that the skirt may be buttoned to a stout tape or band running around the bottom of it, a comfortable belt or sash covering this. Remember that the question of appearing well dressed, like the question of seeming to have a good figure, really depends more upon the carriage and development of the body than upon its external covering. Without a well-modeled body and a good carriage, nothing can make a woman look well, no matter how much money she may choose to spend upon her adornments, whereas if she has the necessary physical foundation, with the poise and carriage of a queen, she cannot help but look well even in simple, inexpensive garments. The woman herself is the all-important thing, and not her clothes.

EXERCISES FOR GENERAL PURPOSES.—Aside from the special exercises for women given in this chapter, I am offering on the following pages movements of a general nature for

all-round development and constitutional benefit. They are such movements as one might find pleasure in taking just before going to bed, or for the purpose of arousing an active circulation in preparation for the morning bath. In many cases it is desired to take all of one's systematic exercises the first thing in the morning, including such movements as are necessary for overcoming specific defects, but when such is not the case it is usually well to take three or four minutes of light exercise for awaking the activities of the body in general, or for warming up for the bath.

In this connection I also wish to call attention to the general calisthenic exercises, and other systematic movements presented in connection with *Class Drills*, in Chapter No. 1, on *Exercises and How to Use Them*. These will all be useful for the same purpose and are adapted alike to the needs of both men and women. It may prove to be a good plan to vary the general exercises which one indulges in, shifting from one form of class drill to another, in order to maintain the interest through this variety, and also to get the very best results.



In this exercise for general development the heels are placed close together with toes slightly pointed outward. Lower the body to a squatting position, at the same time raising the arms to a horizontal position. Raise the body and drop arms to side.

There was at one time a general fear among women that by taking of exercises they would acquire masculine outlines, but this fear was grounded in the complete ignorance of the facts of exercise and its results which was almost universal until recent years. If there should be still a few who entertain this fear of masculine tendencies growing out of the development of the muscular system, let me say positively that there can be no such result, for the muscles of a woman do not take on the same rugged form, even though just as powerful as those of a man. Furthermore, a woman always carries a little more adipose tissue, rounding and smoothing off all of the contours of the body.

Exercises for women, far from making them masculine, will only make them more womanly in outline and contour. It is the undeveloped female, emaciated and shapeless, who most resembles the undeveloped masculine form. Development and health bring out womanly qualities, thus giving her the grace-



In this exercise for general development at the right the arms are raised straight above the head and then lowered until tips of fingers touch the toes, the legs kept rigid. This is the oldest and considered the best of all setting up exercises. In the exercise at the left the hands are on the hips and the body then lowered as pictured here, the knees kept together. Keep the trunk upright in making the dip.

ful outlines which mark her sex. Instead of making her figure coarse or crude, exercise will give her an exquisite contour of every part, and proof of this can be found in works of art which have come down to us from the ancient Greeks, modeled to perpetuate the types of athletic womanhood trained in the gymnasiums of that far-away and classic age. And to-day, it is the athletic girl, and only she, who serves as the ideal of the modern sculptor, for the non-athletic woman, weak and soft, is only a caricature of her sex, when not actually deformed by vicious devices of clothing.



With the feet about a foot apart, raise the arms to a horizontal position, taking care to keep them straight and rigid. Swing the upper part of the body half way around and then bend over until the fingers touch the floor. Alternate right and left.



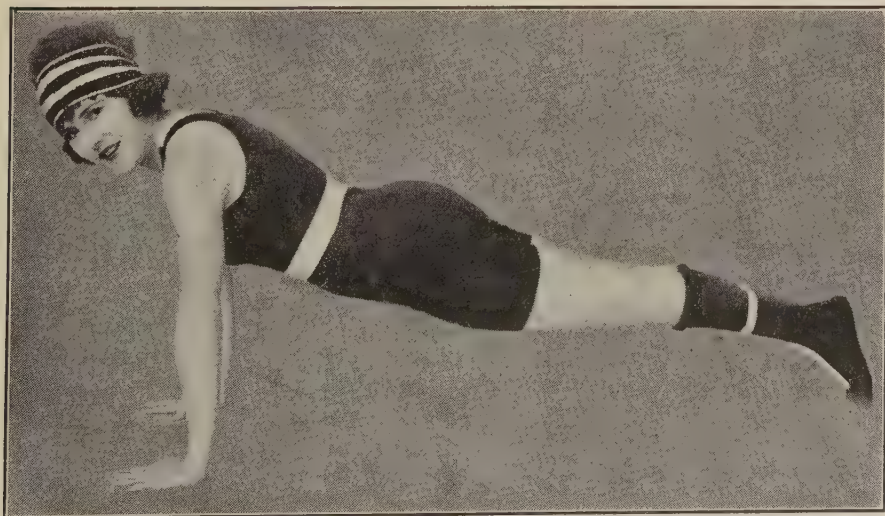
With hands resting on the hips bend the trunk back as far as possible, and slowly bring it to upright position.



Raise the arms straight into the air bringing the fingers of the two hands together. Then swing the body, from the hips up, right and left as far as it will go.

A woman's muscles will never become corded and knotted, will never stick out like "billiard balls" from her forearms and shoulders, as some critics of physical training for women have suggested, in their ignorance. On the contrary, exercise will develop elasticity and strength in muscles of a smoothly flowing formation giving that character and firmness to one's flesh without which grace and real beauty are impossible.

Light exercises are regarded as best for attaining this condition, exercises that while



With only the toes and the flats of the hands resting on the floor, lower the body to the floor and raise it again.

strengthening all the muscles, keep them flexible. Heavy exercises, as is known, make for slowness and heaviness of movement, and this is destructive of grace. Dancing, fencing, etc., are among those exercises that develop grace. The charm of symmetrical and harmonious bodily development is that nothing is obtrusive, no part is over-prominent to offend the eye, but all is pleasing smoothness. There are no striking curves, as the form of corseted figure models might lead one to believe, but the curves and lines are so delicate they seem to melt into each other; and of measurements as of eighteen-inch waists and thirty-eight-inch busts this can hardly be said.

EXERCISES FOR SPECIAL PURPOSES.—On the following pages are presented some special exercises for women for various individual parts of the body and specific purposes. In all cases a series of general exercises is to be advised for purposes of general development and constitutional benefit, in addition to any of the movements illustrated here, but in many a course of general exercise is not sufficient to get the best results. There are few who are not more or less one-sided in their development, or particularly lacking in some special part, and in order to overcome such defects and bring them up to the normal symmetry of the rest of the body, some specific exercises are necessary. If one is particularly lacking in the development of the hips, for instance, she should pay special



NO. 1. FOR THE EXTENSOR MUSCLES OF ARMS.—Lying face downward, with hands on the floor at the shoulders, push up to arms' length with the upper body, hips remaining on the floor. Repeat until tired. If this proves easy, then execute the same exercise with the entire body rigid, thus raising hips and all parts except toes and hands.

attention to the building up of these parts, adhering to the necessary exercises faithfully every day, no matter what else she may do for the sake of her all-around physical improvement. The various topics are taken up alphabetically.

Abdomen.—See *Stomach and Pelvic Region*.

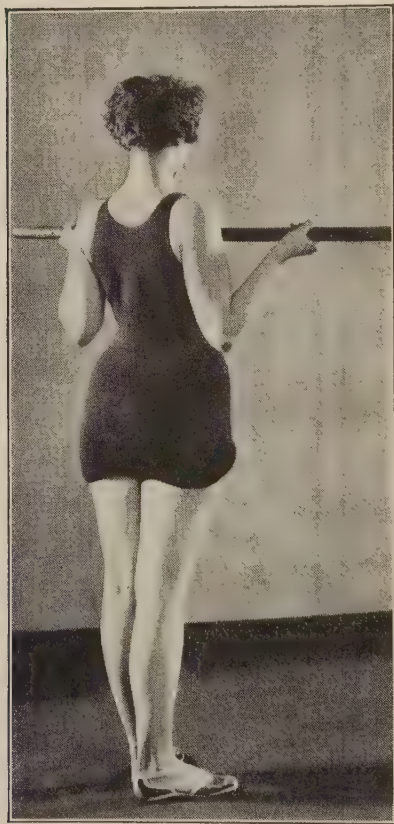
Arms.—A well-rounded and beautifully developed pair of arms will go far to distinguish and to add to the personal charms of any woman, because of the fact that so many of the fashions of dress permit of the exposure of the arms. A small and undeveloped condition of these members has been a source of regret if not of vexation or humiliation to thousands of women, for it is through the condition of the arms as a rule that one may measure or conceive the general bodily condition of the owner. People may do this unconsciously, but they nevertheless cannot escape forming an opinion from what they see as to whether you are well developed, emaciated or otherwise, wholly apart from those general lines of the figure which in many cases are completely disguised by the artifices of dress.

The arms are used so extensively in most of the activities of life that one may easily find a multitude of serviceable exercises for them in addition to those presented here, which are very simple though effective. It really does not matter so much just what exercises one takes, so long as they vigorously bring into play the muscles for both flexing and extending the arms.

As for the forearms and hands, it may be said that exercises for these parts should consist chiefly of taking hold of things and developing what is called the "grip," for which reason all apparatus exercises are valuable if one has the facilities convenient. The mere act of taking hold of a bar above the head, and suspending the weight from it, will provide for the use of the grip, which really means the muscles of the forearm. The flexing of the hand in all directions at the wrist will also improve the forearm, involving all of the muscles of these parts not used in flexing and extending the fingers. Simple flexing movements of the wrist with dumb-

bells in the hands will answer all the requirements of these muscles in most cases.

Back.—In discussing the subject of proper carriage I have already alluded to the importance of strength in the muscles of the back, for it is chiefly upon these that one depends for the upright attitude of the upper body. With a weak back one can accomplish almost nothing. Indeed, one need only refer to the number of women suffering from weak-



NO. 2. FOR THE ARMS.—Standing in an open door, and grasping with both hands a broom handle or other long strong stick braced against the other side of the door sash, lean backward until the arms are straight, and then pull yourself back to the position shown—until tired.

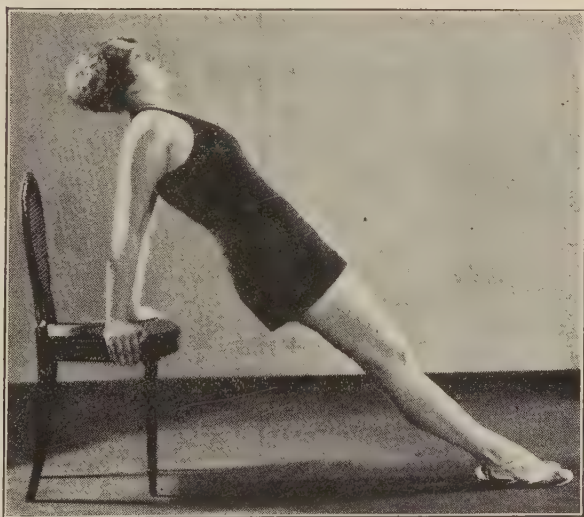
ness in this region to emphasize the importance of special attention to its development. The spinal column is the central part of the human anatomy, and as I have tried to make clear in other places, robust strength of its supporting muscles should be the very first object of all consistent physical culturists.

I would especially direct the attention of woman readers to Chapter II, of this volume, *How to Develop a Powerful Physique*. Even the portions dealing with exercises for men will afford suggestions for women. It is true that some of the exercises suggested there will be found of a nature entirely too vigorous for the average woman, or otherwise unsuited, but others of the movements illustrated will be of great value, and it is well also to understand the reasons why these exercises are of such value in building vital or nervous energy. Chapter VII of Volume I takes up this matter.

In addition to the simple movements illustrated here for strengthening the back I wish also to suggest those which have to do with bending the body forward, a number of these being illustrated in connection with the *Class Drills* in another place.

Breathing.—The subject of proper breathing is so important that although it has been taken up elsewhere, it has been thought best to make brief reference to it here lest it should be overlooked. There is perhaps no phase of physical training which is of more vital consequence than this matter of breathing, for it is upon this uninterrupted respiration that we depend to keep up the very fire of life. Any stoppage of the breath is very quickly fatal, and since the very fact of continued breathing is so important, the quantity and character of it is also a pertinent consideration.

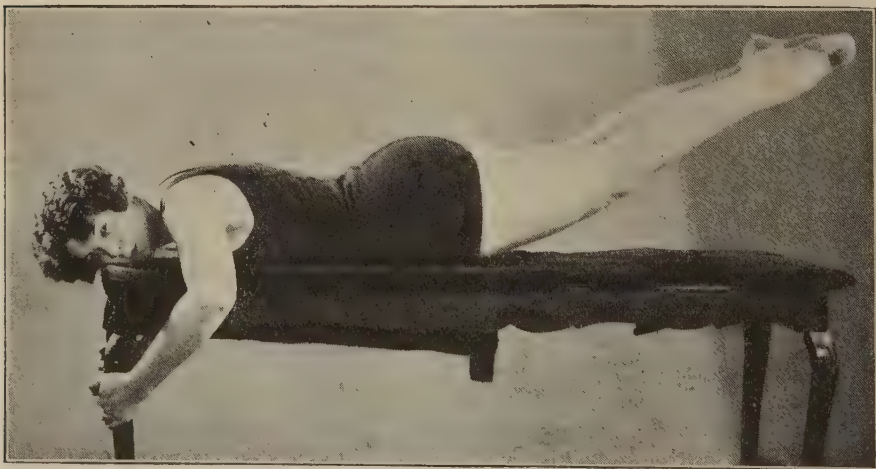
Natural and deep breathing should especially be given attention by women because of the manner in which most fashions in clothing have interfered with its possibility. The wearing of two piece garments with constricting skirt bands and belts at the waist line, practically prevents any attempt at natural breathing, and especially so because of the corset which so many women still use. This interference with the very bellows of life is only one of the crimes of the corset, but it is one of the most glaring



No. 1. FOR THE BACK.—With back to chair, hands on seat, and feet removed some distance, as in illustration, raise the back and hips just as far from the seat of the chair as possible, lower again and repeat, continuing until tired. If this seems easy it may be done with hands on floor.

ing of them all, and without doubt goes far to explain the reasons why men have in the past regarded women as the "weaker sex." Hardly anything else could be expected of them, with their breathing apparatus restricted in this manner. If men had been subjected to the same fashion for several centuries, having the greater part of their breathing apparatus cut off from service, with chest walls pushed in, and abdominal viscera pinched almost beyond endurance, while at the same time the bodies of women were free and untrammelled, we should now have a very different story to tell as to which is the "weaker sex."

The first necessity, therefore, not only for correct breathing, but for the health and general development of the body, is to get rid of the corset, and to wear such clothing as will permit of the free expansion of the body in the region of the waist line and abdomen. Even if the corset is abandoned, the use of a separate skirt, with its cutting band, will still interfere with any normal breathing, leaving the victim to depend upon the expansion of the upper chest, for respiration, and neglecting the great lower portions of the lungs.



No. 2. FOR THE BACK.—Lying across a table or one end of a couch, face downward, and taking hold with the hands, raise the legs and hips as high as possible. Repeat until tired. If only the legs are raised this will affect the hips chiefly, but if endeavoring to raise the hips as well, the muscles of the entire back will be vigorously used.



NO. 1. FOR THE BUST.—Standing two or three feet away from a table or other similar support, with hands on edge, and body just about touching it, as in the upper photograph, push up to arm's length as in the second illustration, with body rigid. Repeat until tired. Though this also employs the extensor muscles of arms, it is intended chiefly for upper chest muscles.

The reader should study the discussion of proper breathing in another chapter and pay close attention to the illustrations presented there. It should be noted that in the expansion of the lower part of the torso through diaphragmatic inspiration, one can feel the sides of the body expand outward, and the lower back backward at the same time that the region of the stomach moves outward in front. This complete expansion of the body all around is the essential and also the test of proper breathing.

Bust and Chest.
—The development of a perfect and beautiful bust is one of the first requirements of

vigorous and magnetic womanhood, not only because it is an essential to the symmetry and exquisite contour of the body as a whole, but because of its vital significance as an expression of superb womanhood itself. A faultless bust is to be desired not only because of its æsthetic and artistic value, but for the far deeper and biological reason that it is so intimately related to the very fountain of life.

The lack of bust development is an evidence of lack of vitality and health. It is true that one may have the health, so-called, which permits her to be on her feet and to walk around, but she is not a complete woman or in perfect health if she is lacking in this respect. A flat-busted, flat-chested condition may not indicate absolute sterility in a woman, but it indicates a condition of health in which approaching sterility may be a possibility, or in which, if not sterile, she may be productive of offspring lacking the full degree of vitality which should be the birthright of every child. It is significant that large families are the rule among those nations or in those lo-



No. 2. FOR THE BUST.—Lying on the back on a couch or table, (on floor, if more convenient) bring arms back over head as illustrated, then bring them up and forward to the perpendicular. Repeat and continue until tired. The farther down the arms are brought the better. After this, bring them out sidewise instead of back of the head, varying the exercise for different use of chest muscles. It is best if light dumb-bells, books or other convenient small weights are held in the hands in this exercise.

calities characterized by full-busted women—women able to nurse their babies instead of bringing them up on patented milk combinations administered in bottles. The full and perfect bust makes a woman attractive because it indicates her fitness for motherhood, which also to a very large extent explains her magnetic quality.

The first essential of perfect bust development, therefore, is the attainment of the highest possible degree of health and vitality. A condition of vigorous womanhood will assert itself in this way, for upon this fact, together with the requirements of perfect nutrition, depends the development of the glands of the breast which give it fullness. Next to this, a certain degree of muscular vigor is essential to prevent that sagging or falling of the parts which is inevitable in a state of weakness. On this account special exercises are indispensable.

I am presenting here some simple exercises which affect the muscles of the upper chest, not only because a full and well developed chest is necessary to serve as a sub-structure for the bust, but because it is the use of these muscles which will directly influence and invigorate the bust itself. It should be remembered that these muscles are concerned with the movements of the arms and shoulders, and that any other ex-



NO. 3. FOR THE BUST.—This is similar in principle to the last movement. Lying on one side, bring upper arm up, back and over the head, as illustrated, and then bring down to side again until tired. Same on other side.



"Egeria," sculptor unknown, a masterpiece of modeling, showing the ideal female torso of perfect development. Note that the bust is small in comparison with the common ideal, but far more perfect and beautiful than excessive, flaccid tissues. Womanhood, vitality, power and grace are expressed in this figure.



"Fortune," by J. Franceschi, showing the artist's ideal of a perfect bust development, and indicating the error of the popular conception of an over-large bust as the perfect type. The small, though firm and well rounded bust is the ideal of all artists, and the most perfect evidence of superb, magnetic womanhood.

ercises which have to do with pulling the arms and shoulders forward, or pulling the arms downward and forward from overhead, will also be effective.

There is one important phase of the subject, however, which deserves special attention, and that is the misunderstanding of the popular mind as to just what constitutes a perfect bust development. It is thought in many quarters that the ideal development of the bust is a very large one, but there never was a greater mistake. An excess of size in this part often means that a deposit of flaccid adipose tissue has taken the place of atrophied glands and muscles, so that conditions may be even worse than in the case of the flat-busted woman. Here, as elsewhere, mere fatness is neither desirable nor beautiful. The quality for which the average woman should strive in the bust should be firmness rather than large size, in order that the parts will stand up in the lines of their true beauty, instead of sagging as the large and shapeless breast is sure to do. It is only in the case of motherhood or expected motherhood that the bust should normally exceed the modest size or development of a healthy, vigorous maiden.

I would call attention to works of art everywhere to corroborate what is here said upon this point, for in both the classic figures of the antique and in all of the best works of art of the present day, the reader will see that the universal ideal of artists is a bust which is not very large, but firm and well rounded. Some illustrations of this kind are offered here to help make this point clear.

Therefore do not be alarmed if you have not a large development of the bust. See rather how vigorous it is, how firm, round and full in contour, and how closely it approximates that ideal which is expressed in these various works of art.

Hips.—A normal development of the hips is a most important factor in bringing about the suggestion of perfect femininity, for it is in the lines of the hips that the two sexes differ most widely. The woman lacking in this respect does



No. 1. FOR THE HIPS.—Standing on both feet, raise one leg with knee straight to a horizontal position in front of the body, as illustrated, swinging arms up to level of shoulders at side to help in balance. Do not do this too quickly, for it should be the contraction of the muscles, and not the momentum of a swing, that should raise the leg. Repeat until tired and then take the same exercise with the other leg.

not have the aspect of womanliness, as we have come to associate it with the most perfectly developed representatives of the sex. By this is not meant a large development but rather the normal and natural outlines which go with perfect physical condition.



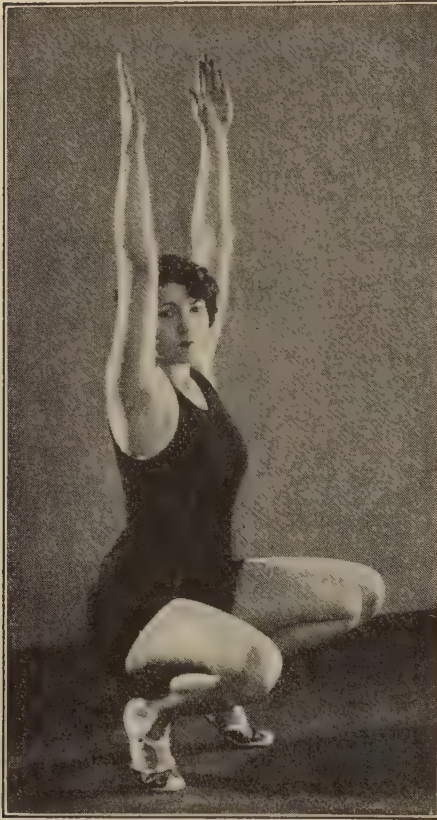
No. 2. FOR THE HIPS.—Similar to No. 1, except that the leg is raised to a horizontal at the side, using different hip muscles. Alternately use both legs.

Aside from the special exercises given here, the reader should note that such activities as walking and running, the latter especially, and all pastimes which have to do with walking, running and jumping, call for vigorous use of the muscles of the hips. And all such exercises will be equally valuable for reducing the hips when too large and burdened with fatty tissue as for building them up when too narrow and small. The influence of exercise in all cases is to restore a normal condition of the parts concerned, and thereby to bring about the condition of greatest possible symmetry and beauty. All open-air sports, therefore, can be recommended in connection with special exercises for improving this part of the body. The general lines of the figure depend upon the hips to such an extent that they should not be neglected.

Legs.—Not a great deal needs to be said here about the



No. 3. FOR THE HIPS.—This is similar to No. 1, except that the leg is raised straight backward, as in this illustration. It should be brought up just as high as possible. Same with the other leg.



No. 1. FOR THE LEGS.—Standing first erect, with hands at sides, bend the knees and lower the body to a squatting position, as illustrated, at the same time swinging the arms forward and upward to position overhead. Rise to standing position, bringing arms to sides again and repeat until tired. This is a simple and common exercise, but is performed with greater comfort with this use of the arms to balance the body.

No. 2. FOR THE LEGS.—With feet well apart, lower the body and squat down on the heel of the rear foot, as in illustration, keeping the back straight. Rise and repeat several times, after which take same exercise, on the other side. The rear leg should carry most of the weight of the body in performing the exercise, making it more vigorous than the preceding movement. Also good for rounding the knees.



lower limbs, inasmuch as they will be vigorously employed by many forms of outdoor exercise if the intelligent seeker for health and strength devotes herself as fully as she should to all available open-air games and sports. A couple of exercises are illustrated here which will be of value, and which may be practiced night and morning if there seems to be any special lack of development of these parts. I would add, however, that the practice of running is the very best exercise in the world for developing the legs, and indeed, for furthering strength and vigor of the entire body, and the systematic practice of sprints in bloomers or other suitable costume cannot fail to beautify and make symmetrical any pair of legs.

Neck.—A perfectly developed and beautiful neck is one of the very first charms for which the physical culture woman should strive, for even more than the arms, it is a part of the



FOR THE NECK.

No. 1.—Turn or twist head far to one side, looking back over the shoulder as far behind you as possible, then far to the other side. Repeat until tired. Be sure to put the muscles of the neck on stretch in each direction.

No. 2.—First bring the head as far back as you possibly can, looking straight upward and stretching the throat, then bring the head forward as far as possible, with the chin resting upon chest, and stretching the back of the neck. Repeat until tired.

No. 3.—Bend the head first far to one side then to the other, continuing back and forth until tired. Stretch the muscles each way in this exercise, practically laying the head first on one shoulder, then on the other.

body that every one sees and cannot help seeing. Sometimes the fashions for women seek to cover up the neck, but even in such cases its form and character are more or less evident through the lace or other covering. A thin and scrawny neck is not only ugly in itself, but it expresses a lack of vitality and of general development, just as a full, round throat and a well-set aspect of the back of the neck indicate life and vigor. After realizing the importance of strength of the spinal column, the reader will understand why a well-set neck is associated with energy and power. Others may not understand the reasons for this, but instinctively they get the same impression of an individual, and, whether this is unconscious



No. 4. FOR THE NECK.—Showing another most effective form of exercise for the neck. Lying flat on the back across a bed or upon a couch, and with head extending over the edge, let the head hang far down as in the illustration, and then bring it upward and forward until the chin touches the chest, or as far as possible. Repeat until tired. Take the same exercise lying face downward, and then lying on each side. The movements are practically the same as in No. 2 and No. 3, except that in this case they are more vigorous because of the resistance of the weight of the head. If the exercise has a tendency to cause dizziness, it is because of poor circulation, and in such a case one should only use the first three exercises, in the upright position, until stronger.



NO. 1. FOR THE SHOULDERS.—From position with shoulders far back and down, shown in illustration at the left, raise shoulders as far upwards as possible, as indicated in illustration at the right. Repeat exercise until muscles employed are thoroughly tired. This is a splendid exercise for filling in hollows around collar bones.



NO. 2. FOR THE SHOULDERS.—Bring shoulders far forward, as shown in illustration at the left. Now bring them as far back as possible, as shown in illustration at the right. Return to former position and repeat exercise until muscles are thoroughly tired.

or not, the woman with an undeveloped or emaciated neck will have great difficulty in giving others the suggestion of personality.

The exercises illustrated here are very simple, but they are none the less effective on this account. They are not of a nature to build a prodigious degree of strength in this part, but rather to develop the neck normally and thoroughly, giving it that combination of grace and strength which makes for the greatest beauty. There are comparatively few of the women whom one sees on the street, at the church or any other place who have really perfect or beautiful necks, and yet there is not one of them who could not have this pleasure if they would give only a little attention to the subject. They may envy the graceful throat of some other woman, deploring the condition of their own, but I wish here to emphasize the fact that the neck is one part of the body that responds most quickly to exercise. It is often surprising to note the improvement that may be accomplished by these simple movements diligently persisted in for a period of a few weeks. Tight and stiff collars should be avoided above all things, for there is nothing more destructive to the beauty and contour of the neck.

Shoulders.—In a general way the beauty of the shoulders is associated with that of the neck, just as their lack of beauty is associated with an undeveloped condition of the latter. It is true that the shoulders are ordinarily covered up, and yet their beauty is often more or less manifested through laces and other forms of summer dress. Many young women desiring to wear evening dress have been humiliated by the fact that they would be absolutely unpresentable in any costume which disclosed the shoulders.

To a very large extent, the possession of beautiful shoulders is a matter of development and their proper carriage. A lack of strength in the muscles back of the shoulders gives rise to the tendency toward round shoulders, and exercises will not only establish them in their proper position but will develop and fill out their contour. To a great extent also,

the beauty of these parts depends upon satisfactory nutrition, and if the unsightly hollows which sometimes mar the front of the shoulders are to be overcome, it is necessary that one pay close attention to a proper diet, insuring a good digestion and faultless assimilation, and building up the very highest degree of general health. Un-

der conditions of satisfactory nourishment, the practice of these special exercises cannot fail to produce a perfect and exquisite beauty of the shoulders.

Together with these, there are many other arm movements and some exercises for the chest which will be very helpful in improving the shoulders. Exercises which bring the arms backward, and to some extent those which bring the arms upward, will be effective.

Stomach and Pelvis.—

There is probably no other form of weakness so common among women as that of the muscles and tissues in the region of the stomach and abdomen. For this reason too much could hardly be said to urge the importance of adopting special exercises for strengthening and developing these muscles, and in that way invigorating the internal organs and making firm all of the other tissues adjacent.



NO. 3. FOR THE SHOULDERS.—Stand with arms outstretched in front, fingers touching, then swing them backward and downward to the position shown in this photograph, if possible letting the hands touch behind the back. Repeat until tired. Not only are the muscles of shoulders and back employed in this exercise, but the shoulders are pulled down as well as back and the chest expanded.

NO. 1. FOR THE ABDOMEN.—With hands on edge of seat of chair, and feet two or three feet away, lower the body to the position shown in this photograph. Then without moving hands or feet, raise the hips and back as high as possible, lower and repeat, continuing until tired. Do not do this with the effort of the arms, but by muscles of abdomen.



NO. 2. FOR THE ABDOMEN.—Seated on a stool, with hands on hips, and feet apart, bend first to one side, then far forward, almost to the knees, then to the other side, in the manner illustrated. This may be made one continuous rolling movement. Continue until moderately tired. This not only exercises the external muscles, but in a way massages the internal organs as well.

A very large proportion of women suffer from all kinds of disorders of the delicate pelvic organs, disorders which are for the most part the direct result of weakness and laxity of these tissues, poor carriage and imperfect circulation, the latter largely growing out of the other two causes. There is substantially one way for correcting the condition of stretched ligaments, prolapsus and general laxity of all parts, and that is through exercise. This is a matter that is taken up in a later portion of this work, in connection with its curative aspect, but it may be said just here that practically all difficulties of this kind may be avoided in the first place by any form of exercise which will develop the muscles of the stomach and abdomen and strengthen the entire pelvic region generally. Here, as elsewhere, the preventive method is infinitely more wise and important than the curative, although substantially the same general scheme of exercise and vigor building will apply both in prevention and cure.

Perhaps the very best exercises for the muscles of these parts are the simplest, and it is such that we are illustrating here. The student of physical culture will know a great variety of other exercises which will accomplish the same results, and many of them are illustrated in connection with the class drills and other series of exercises in this work.

It seems to be the common notion that a woman's body is naturally soft in these parts, in spite of the fact that the walls of the stomach and abdomen are very rugged and strong in the case of the male sex, when in good physical condition. In other words it seems to be taken for granted that the stomach and abdomen of a woman should be flaccid, shapeless and altogether without character, a hopeless and impossible suspension of loose flesh when not retained and supported by a corset. To say nothing of the actual possession and toleration of such a condition, even such an idea of the temple inhabited by earth's intended fairest creature, is something to be ashamed of. But it is not true that any such is a natural condition, for when normally and naturally developed, a woman's body should be just as firm and snug and sym-



NO. 3. FOR THE ABDOMEN.—Lying flat on the back, and keeping the knees straight, raise the legs in the manner illustrated, continuing the movement until they reach the perpendicular. Lower and repeat, continuing until tired. If this seems a little too vigorous at first, then perform the exercise with only one leg at a time until stronger.



NO. 4. FOR THE ABDOMEN.—Sitting first on the edge of a chair, and with feet braced under some heavy object of furniture, bend backward and downward, with outstretched arms, to the position illustrated. Then rise again to the sitting position and repeat. Continue until tired. It may be well to place a pillow over the chair for comfort. This is a very vigorous and effective exercise, but may be made easier by not extending the arms, and also by not lowering the body so far.

metrical in these as in any other parts. There should be the same substantial external wall of muscles covering the abdomen and the region of the stomach that we see in the male athlete, though naturally in the case of womankind there are not the same rugged and conspicuous outlines. Everything is smooth. If only for the sake of avoiding the danger of serious ruptures, every woman should make it a point to strengthen these parts, but exercises for this purpose will also help her to consume and obliterate the layers of fatty tissue which so often accumulate over the abdomen. Although, as pointed out heretofore, a prolapsed condition of the internal organs may usually be traced back to weakness of the back and the consequent faulty carriage, or at least largely so, yet weakness of these muscles is a contributing cause in most instances, and their vigorous development will help greatly in improving the carriage and avoiding prolapsus in the future.

In discussing the weaknesses of this part of the body we continually come back to the baneful influence of the corset. We simply cannot escape the consideration of this iniquitous device, just as women who wear it cannot escape the inexorable physical dilapidation which it brings about. The corset, more than anything else, is responsible for the common weakness of the pelvic region among women, both directly through its immediate influence upon the parts themselves, and indirectly through its influence in weakening the back and thereby disturbing the poise and alignment of the entire body, with the consequent prolapsus of all organs.

These exercises are of special value for invigorating the digestive organs and thereby improving one's powers of assimilation.

Waist.—We are illustrating herewith some special exercises for beautifying the waist. A firm, snug and symmetrical contour of the body in the region of the waist is an absolute essential to the physical culture woman who wishes to present a good appearance, and although general exercise will usually bring this about in due time, it is often well to pay special at-

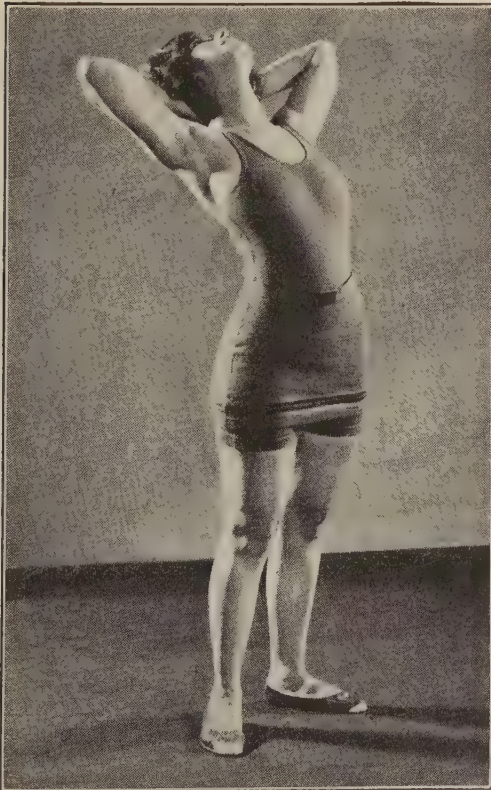
tention to this part of the body. Until very recent years the average woman depended upon the corset to determine what her waist and body form should be, having her clothing made to suit the model of the corset. But how much more pleasing must it be to the woman of today to know that the figure she presents is truly her own, so that instead of the hypocrisy of displaying a purchased form, she may take pride in the consciousness that the admiration of others comes in response to the charm of her own real self.



No. 1. FOR THE WAIST.—Placing the hands on the hips, bend first to one side, then to the other, in the manner illustrated. Continue back and forth until tired, carrying each movement far enough to place the muscles of the other side on a stretch.

However, the average woman even today disregards shamefully the simple rules of health that would help her to maintain her figure of youth, and too many find themselves burdened with masses of shapeless fat, especially about the abdomen and waist. But with the practice of special exercises, faithfully persisted in mornings and evenings, she can accomplish almost a transformation of her figure. It may be said here that it is better to take exercises for special purposes twice a day, while systematic exercises for general development and constitutional benefit should usually be taken but once daily.

NO. 2. FOR THE WAIST.—Charge to the position shown in illustration, with arms outstretched, then turning the body at the waist, twist or swing far around first to one side, then to the other. Continue back and forth until tired. This exercise is of little value unless the body is turned just as far as possible in each direction with each move.



NO. 3. FOR THE WAIST.—With feet apart, and hands behind the head, bend first backward in the manner illustrated, then swing around, bending toward the right side, and continue in a circular movement around to the front, left side, back, etc. After several turns, reverse the movement, going in the other direction, and placing the body as much as possible on a stretch at all times, in the region of the waist.

It will be encouraging to those who are in the worst condition to know that it is precisely they who will be able to make the most startling changes and improvements in the shortest time. When very poorly developed, the body will respond quickly to exercise, and will rapidly progress to a point not far from the normal. After securing a pretty fair development, however, it will take a great deal of persistent exercise to carry the development only a little farther. Wherefore, let the hopeless ones take hope, for they should soon be in a condition to surprise all their friends, as well as themselves.

ROLLING AS AN EXERCISE.—Rolling is a very interesting and suitable form of exercise for women, and has been much recommended for removing superfluous flesh. That it is a natural and beneficial form of exercise may be attested by the fact that it is spontaneously or instinctively practiced by animals, and also from the fact that small children often find great pleasure in rolling over and over on the grass or down the slope of a smooth lawn. Who has not seen a horse, a dog or a cat roll and kick and stretch on the ground, invigorating and improving the circulation in all of those parts which come in contact with the earth?



First position for the "roll." Note position of arms and legs. Upper arms protect the bust. Legs well extended. As will be readily seen by a study of the muscular anatomy of and exercises for certain regions of the body, it is a comparatively simple matter to select exercises having definite effects upon just that part of the body requiring correction, though some general exercise is always necessary also.

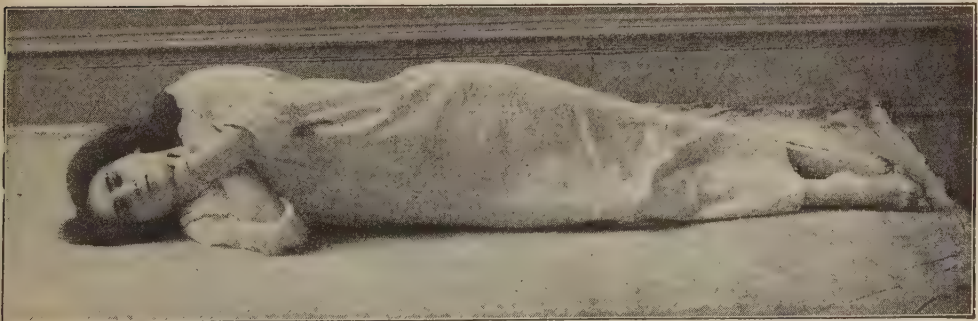


A crew of young women from the Girls' Sculling Club founded by the late Dr. Furnival, passing under Barnes' Bridge, near London.

It is not merely the exercise of the muscles concerned in bringing about the movements of the roll which are benefited, for perhaps even more important is the fact that the weight of the body is brought by turns upon its various surfaces, affording a practical and most satisfactory massage of nearly all parts of the person, stimulating the circulation to a powerful degree and tending to displace soft or useless flesh.

A bed of green grass is the very best place for the roll, if one has a lawn convenient, and can slip on a suitable robe. Otherwise, spread a sheet over a rug or carpet and roll back and forth in each direction until tired. The less clothing worn the better, in fact, nothing more than a plain night robe should be used.

ROPE SKIPPING.—Rope skipping is an exercise particularly to be recommended for its fitness to the needs of women. It is in truth just as well adapted to the needs of men, and is used extensively by boxers in training for extended contests, but it has that element of grace and lissome activity which appeals most powerfully to the feminine temperament. There is no pastime more dear to the heart of the school girl, in whose physical development it frequently plays the most important part. However, since childhood is suited to games



Second movement, in which relative position of arms and legs is retained. If one desires she may take in connection with this rolling the various reclining exercises, either before or after the simpler exercise. While lying on the back, the abdomen, and on either side, the extremities may be exercised in various combinations; but this is not a part of the rolling exercise.

of activity and agility, but without the stamina for prolonged endurance, the young school girl should be advised against trying to make records as to the number of jumps or skips she can go with the rope. She should be encouraged in this excellent exercise, but with the suggestion that she strive for variety of fancy steps, none of them very long continued. In adult womanhood, however, there need not be any fear of overdoing by too prolonged exercise, provided the rope skipping is not continued for more than ten or fifteen minutes. More time, with brief intervals of rest, would be better, but young women, when in fairly good training, have possibilities of endurance like those of young men.

ROWING.—As splendid an exercise for women as for men, this wholesome outdoor sport is described on page 930.

RUNNING.—Running is a vigorous and most beneficial form of exercise for women, not so much as a competitive sport, but as a means of physical development and health building. There is nothing in the world that will do so much for beautifying the hips, though the legs will also be perfected to the highest degree through daily sprints. There was a time when it was thought “unladylike” for a young woman to run, but the world is modifying its opinion upon this subject, in the direction of common sense, and games for women in which running forms the greatest activity are now very numerous.

In Chapter III of this volume, the subject of running is discussed in detail, under the head of track athletics, and while our fair readers may not be interested in the competitive aspect, nevertheless they may glean some points of form which will be very useful. It is comparatively easy to overdo this vigorous exercise, and I would therefore emphasize the caution *never to continue running after it has ceased to be a positive pleasure*. Observing this rule, however, it would be well to do a little running every day.

SPORTS AND GAMES FOR WOMEN.—All manner of open-air sports and games are especially to be recommended for women, in order that they may develop the same splendid stamina and endurance that their athletic and sports-loving

brothers enjoy. Tennis, golf, rowing, riding, swimming and other vigorous outdoor pastimes will not only develop strength and promote the most vigorous health, but will do more for accentuating the natural beauty of girlhood than all other influences combined, with the exception of a wholesome diet and systematic exercises for special purposes. It needs hardly be repeated that outdoor exercises are infinitely more valuable than those performed indoors.

Our fair readers are respectfully referred to the chapter in this volume on *Competitive Exercises and Sports*, for a somewhat detailed discussion of all prominent outdoor pastimes. It may be said that there are very few, if any, of these which are not as well suited to women as to men.

WALKING.—Though the subject of walking has been taken up in another place, it is mentioned here because of its value and importance to women as a means of acquiring health and beauty. It is a form of what we may call constitutional exercise, valuable for its health-building qualities rather than



Photograph by Keystone View Co.

The very structure of woman suggests that walking, above all other exercises, best fits her health-needs, developing, as it does, movement in practically every important muscle in the body.

as a means of any special bodily development. It improves the circulation and the digestion, tones up all of the vital and functional organs, favors perfect action of the depurating organs and brings about that purity of blood that gives a good complexion. No matter what special and systematic exercises one may take for building muscular strength and symmetry, every one should do at least a certain amount of walking in the open air, breathing the pure air freely. The reader is referred to the general discussion of this topic in Chapter I, page 766.

CHAPTER VIII.

DANCING AS AN ART AND AS AN EXERCISE.

DANCING was perhaps the first form of organized exercise to which man voluntarily turned. Men and women of primitive times stood in little need of additional exercise for developing strength, for the strenuous demands of their every-day lives provided more than sufficient exercise of this sort. But dancing provided quite a different kind of outlet for their energies. Dancing developed the dancer and at the same time filled the human need for self-expression. As Havelock Ellis has said: "The art of dancing stands at the source of all the arts that express themselves first in the human person."

The dances that served primitive man as a natural means of self-expression have been handed down to us through the ages in modified form as folk dances. These natural and informal dances are most effective in promoting physical development and grace. The set forms of dancing in which couples engage upon the floor of the ballroom are not so useful for this purpose, although in their later development they have become much freer in form, allowing for greater individual action.

Dancing, like song, is a form of expressing emotion and joy that man shares with many of the birds and insects. The universal appeal of the art of dancing comes from the fact that the living body itself is the material of the art.

Dancing was developed into a fine and beautiful art closely related to music and poetry by the Greeks. The Greeks held that dancing is an essential part of culture, and Plato states that "The man who finds no pleasure in dancing and gymnastics is a rude, unpolished clown."

One of America's great educators, G. Stanley Hall, believed that "A revival of dancing is imperatively needed to give poise

to the nerves, schooling to the emotions, strength to the will, and to harmonize the feelings and intellect with the body that supports them."

Dancing is developed as a highly skilled profession for artistic entertainment of the public, yet dancing as an expression of joy and feeling should also be the privilege and pleasure of every man, woman and child. There is no greater folly or cruel perversion than the idea that dancing should be confined to the formal social occasion, and that it is undignified to dance in a free and natural manner.

Perfect muscular control is the basis of the dancer's art, and is chiefly marked by the untrained observer as a sense of agility and lightness. There is another essential to the perfect beauty of the dance that is closely interwoven with the sense of graceful activity.

The idea of the dance is often limited to the motion of the movement of the feet and legs. But the true dance involves the entire body. The legs that support the body are of necessity constant participants in the action, but they do not form the chief element of artistic expression or emotional revelation. It is difficult to separate the action of any part of the body from that of all the rest for purposes of analysis. But the heavier elements of interpretation are revealed by the position of the trunk and head, whereas the finer, more varied and more active details are given by the arms and hands.

In recent years a great and constantly increasing number of men and women have taken up dancing not merely as an accomplishment, nor entirely for the pleasure they derive, but for the actual physical profit.

The revival of interest in the Greek and other natural and self-expressive forms of dancing, the Russian, for example, has been in no small measure responsible for the greater freedom developed in social or ballroom dancing.

It is for men and women awake to the value of the combination of joy and exercise that this chapter is written, rather than for those who have manifest talent for dancing.

The ritual of the dance is as old as the stars. The earliest

form of dancing, as we know it, no doubt was practiced among the Egyptians, and was done out of doors, as they had no theaters. The Greeks had theaters, but they also danced in the open. To them the dance was a cult, an element in the religious and physical well-being of the individual and the state, and the dance that was taught to the child became an important and lasting factor in the physical growth and culture of the people.

For the *men* they had their Pyrrhic Dance, comprising a series of war incidents to teach the youthful soldier how to advance, retreat, aim a blow, hurl a javelin, leap, and vault. But the *girls* took part in purely festival dances, in which physical culture and grace were the chief aims. Men and women rarely danced together. One of the exceptions was the Hormus or Collar Dance (as it was called) which was danced by youths and maidens advancing one by one, in the form of a collar, made up of alternate jewels of feminine grace and manly strength. We of today are following the Greek idea of out-of-door dancing in our masques and pageants.

Dancing, always productive of the finest of physical and mental benefits, is at its best if done in health-giving surroundings of sunshine and fresh air. I disagree with those who may contend that athletic sports have a tendency to make women muscle streaked and square shouldered, and that woman's beauty is spoiled by such exercises as "chinning" on a horizontal bar or swinging Indian clubs, which develop shoulders more like those of a Hercules than of a Venus. But women *can* combine muscular ability with feminine grace.

Marie Taglioni, born 1804, of Italian-Swedish parentage, was a hunchback as a child, yet she overcame her physical defect and became one of the foremost dancers of her day, and her name has gone down in history. Recently I have had reports of cases of spinal curvature being completely or very largely corrected by dancing exercises, especially ballet dancing. The various body-bendings and rotations and the alternate muscular contractions and stretchings and relaxations give added strength and tone to the muscles; and they manipulate

the spine so as to open up the spaces between the vertebrae, thus freeing from unnatural pressure the discs of cartilage between each two segments, and allowing them to expand to their normal thickness and degree of elasticity. They also move and tend to adjust the bones themselves, and give them better nourishment for normal growth. Certainly, then, such exercises will be of tremendous value in ordinary health, without deformities.

A chiropractor will treat the spine to overcome most physical ills. I know of no better spine strengthener than daily dance technique exercises at the bar, though, in lieu of a bar, one may use a chair or stand by a heavy table for support.

Why should not the mature woman dance and continue dancing? It is a most beneficial exercise, averting the dreaded fat and keeping the body supple. It makes the blood course through the veins, and keeps one mentally alert, which gives one an entirely different viewpoint of life. Dancing has locked many a medicine closet.

Youth, eternal youth, is the very cry of every normal woman—at least in her heart—and if women would but take the time to look at those who follow dancing as a profession, either as teacher of dancing or on the stage, I venture to say they would find that none of them look within ten years of their real age. Why, it even keeps the voice young. If you doubt it, talk to a dancer or teacher and see how full of vitality her voice is. See how many things she is interested in. Notice her splendid muscles, erect carriage, straight back, well poised head, graceful arms and expressive hands. Compare her, though mature, with the young girl with her debutante slouch, drug store complexion and disinclination for activity—you will find the dancer a hundred per cent lovely woman every time.

'Tis every woman's duty to look her best. Dance for one hour every day and retain your youth and beauty.

Jacques Delcroze says, "The body can become a marvelous instrument of beauty and harmony when it vibrates in tune with artistic imagination and collaborates with creative thought."

DANCING AS A FACTOR IN CLASS DRILLS.—Many physical



A Class in Aesthetic Dancing.

culture instructors and class leaders have found that athletic dances and rhythmic exercises provide a most useful means of lending variety to class drills. Movements have been developed by some of these specialists that have proved effective in not merely promoting muscular co-ordination on the part of their pupils, but in bringing into play groups of muscles that usually remain unused in ordinary forms of calisthenic work. In Chapter IV, page 1017, reference is made to that proportion of such movements that practical experience has deemed best suited to physical drill.

DANCING FOR INDIVIDUAL PRACTICE.—Class instruction, however, is by no means the only method of acquiring knowledge and attaining the full benefits that attend dancing as an exercise. Instrumental music, and the maintenance of cadence by a skilled class leader, are, to be sure, most helpful. But the music of the class drill may be replaced by that of a phonograph or automatic piano in the instance of the individual, or even by songs with rhythm suited to the dancing exercises, or by intoning the spoken count in such a manner as to insure cadence.

DANCING AND ITS EFFECT ON THE PHYSIQUE.—It is true that dancing promotes activity and control of the muscles to a more decided degree than it develops strength. Yet it is equally true that because of the absorption of the individual engaged in dancing exercises, it sustains the interest and insures more vigorous and even longer periods of exercise than is otherwise agreeable or earnestly enjoyable to many persons, and as a

consequence, it is an endurance builder of value aside from its results in making the body flexible and responsive, and developing symmetry, poise and reserve strength.

MOST USEFUL FORMS OF DANCING FOR PHYSICAL DEVELOPMENT.—In general it may be said that the most useful forms of dancing for the purpose of exercise are those involving more or less stretching of the body, in conjunction with movements of the limbs. There is a greater or less degree of exertion involved in all movements that call for balancing of the body, but when these are combined with stretching and turning the body, the effectiveness of such movements increases many-fold. For this and other reasons, chief among them their simplicity and ease of attainment, the folk dances of European countries that have been handed down from generation to generation are of the widest application for class drills and individual practice.

FOLK DANCES FOR THE GROWING CHILD.—Folk dances have been adopted as important features in the physical training of the young in many of America's public schools, and by playground instructors in numerous cities distinguished for their activities in this field. The Playground Association of America, through its Committee on Folk Dancing, in one of its reports, explains what service the folk dance renders in this respect, further pointing out the dances that have proved of value in furnishing active exercise for large groups of children, even when only limited space is available. Considering these dances for their value to the dancer, and not from the standpoint of the spectator, a list of folk dances has thus been submitted, combining the qualities of simplicity, vigorous action, and wholesome, natural spirit. These qualities, it is evident, render such dances useful to the individual, of almost any age or physical condition, as well as for group or class work.

FAMILIAR AND USEFUL FOLK DANCES.—Among the dances that have been found most useful in playground work for the reasons given above, are the Morris Dances of England, handed down for generations; the Highland Fling; the Irish Jigs and Reels; the Italian Tarantella; the Danish Shoemaker's

Dance; the American Indian Dances and many others. These dances are cited to indicate the forms of dances that may be adopted to best advantage by those interested when folk dances seem most suitable to their purposes.

FOLK DANCES AND OTHER FORMS OF DANCES FOR ADULTS.—Folk dances of this character are as well suited to the mature, in class and individual performance, as to the child. Indeed, modifications of them are in use in great numbers of gymnastic classes for business men and others today. Those to whom less restricted forms of dancing for physical development may appeal will find ample field for practice in the Russian and Greek dances, for which detailed instruction is given in text books on the subject.

VALUE OF DANCING IN ALL AROUND DEVELOPMENT.—The value the Greeks placed upon dancing is expressed in Plato's illuminating statement: "Rhythm and harmony are made familiar to the souls of the youths, that they may grow more gentle and graceful and harmonious, and so be of service in words and in deeds; for the life of man stands in need of grace and harmony." A



Steps common in Russian Folk Dancing.

statement that applies to our times far more than to the days of classic Greece!

INDIVIDUAL AND CLASS INSTRUCTION IN DANCING EXERCISES.—Class instruction in dancing, it must be repeated, is of great value in obtaining results, for it cultivates interest and develops the artistic technique necessary for all forms of dancing for physical development. But where this is impracticable, the individual may adapt to his individual requirements forms of folk dancing that may be more or less familiar to him. Books upon this subject will be found of great help. Some to be specially recommended are:

“The Folk Dance Book,” by Dr. C. Ward Crampton.

“Folk Dance Music,” by Elizabeth Burchenal and Dr. C. Ward Crampton.

“Folk Dances,” by Elizabeth Burchenal.

“Folk Dances and Games,” by Caroline Crawford.

“Gymnastic Dancing,” by Mary Wood Hinman.

“The Morris Book,” by Cecil J. Sharp and H. C. MacIlwaine.



Step in Russian and other Folk Dances.

“Old English Games and Physical Exercises,” (for children), by Mrs. Florence Kirk.

“Old Swedish Folk Dances.” A translation of the Hand Book of the Swedish Folk Dance Society.

“Popular Folk Games and Dances,” by Mari R. Hofer.

“Swedish Folk Dances,” by Annie Barr Clapp and C. G. Bjerstedt.

Following are descriptions of some of

the best known folk dances. These dances are simple enough for anyone to work out alone. Though most of them have been developed for group dancing, they provide splendid exercise when performed singly.

BOBBING JOE.

(English Morris Dance—An Old English Folk Dance.)

The count of the dance is "One, and, two, and." The simple Morris step and the "jump," the "spring" and the "caper" occur throughout the dance, and it will therefore be best to explain these first.

MORRIS STEP.—On "and" of the preceding measure raise the right leg forward, swinging it from the hip and keeping the knee straight, and at the same time raising the hands slightly forward with arms extended; then on the first beat bring the right foot down smartly not more than a few inches in front of where it was when the dancer stood with feet together, and at the same time raise the left leg forward with a jerk, keeping the knee straight (one); bring the left foot down smartly not more than a few inches in front of where it was before and at the same time raise the right leg forward with a jerk (and). Bring down the right foot at the same time, jerking the left foot forward as before (two). In this position hop on the right foot (and). The steps taken should be very short, so that very little distance is covered, and the whole step executed on the balls of the feet, not on the tip-toes. When the foot is lifted there should be no attempt to extend the ankle.

During the Morris step the hands are swung backward and forward in a jaunty manner, with the elbows somewhat bent. Thus: Swing back (one, and), swing forward (two, and).

The hands are kept below the waist level, and should come rather close together on the forward swing, and swing out and apart on the backward one.

THE JUMP.—Swing the arms back hard and bend the knees slightly in preparation for the "jump" (one); swing the arms vigorously forward, chest high, and at the same time jump as high as the length of the foot from the ground, and while in the air hold the legs and body straight and rigid, landing on the same spot, still holding the legs and body as rigid as possible without too much jar (and, two, and).

THE CAPER.—Put down the right foot with a vigorous jump, at the same time raising the left foot forward, with a jerk, as high as the right knee, and swinging the hands vigorously back (one). Pause in this position (and); put down the left foot with a vigorous jump, at the same time raising the right foot forward, with a jerk, as high as the left knee, and swinging the hands vigorously forward and up, chest high (two); pause (and). During capers both legs are perfectly straight,

and the arms are swung as in the Morris step, but higher and harder.

FORMATION.—The dancers stand in two parallel rows, three on a side, all facing forward. They are numbered one, three, five in the right-hand row, and two, four, six in the left-hand row.

THE DANCE.—Introduction. (Meas. 1-4.) All stand still in position, with hands hanging at sides. (Meas. 5-8.) All "mark time" by rising on the toes and coming down again on the heels, twice to a measure, at the same time with a slight movement of the wrist flick the handkerchief out and up the first time and down and in the second.

1. "Foot up."

A1. (Meas. 1-2.) All advance up the room with the previously described Morris step. (Meas. 3.) All retire with two "back" steps, thus: Swing the right foot loosely around across behind the left foot and put it down; at the same time raise the left foot (one); swing the left foot around behind the right foot (and); put the left foot down behind the right and at the same time raise the right foot (two); swing the right foot around behind the left foot (and). During these steps the arms are swung as follows: Swing the left hand (with its knuckles leading and the elbow slightly bent) part way across in front of the body and close to it. At the same time swing the right hand outward, waist high, with the elbow slightly bent; also at the same time incline the head and the body to the right (one, and). In the same manner swing the hands to the left and incline the head and shoulders to the left (two, and). (Meas. 4.) Continue to retire one more "back" step, arms swinging as before (one, and); with the body erect, spring as high as possible from the right foot onto the left foot (two); immediately right about face with a slight hop on the left foot, and with the right foot still free (and). (Meas. 5-6.) Same as Meas. 1-2, but advancing down the room. (Meas. 7.) Same as Meas. 3. (Meas. 8.) Continue to retire one more "back" step (one, and); "jump" at the same time making a quarter turn inward, so that the two lines now face each other (two, and).

B1. "Show and Spring." (Meas. 1.) Number One and Number Six advance a little toward each other and make salutation, thus: Step diagonally forward with the right foot (one); step across behind the right foot with the left foot (and); step diagonally forward again with the right foot (two); hop on the right foot (and). During this measure swing the right hand (having first brought it across the chest) in an elaborate gesture of salutation well out to the right side, at the same time moving the head and body in the direction of the hand. (Meas. 2.) Numbers Two and Five do the same, using the left hand and beginning with the left foot (one, and, two). (Meas. 3.) All step on one foot (One, Three and Five right; Two, Four and Six left), at the same

time swinging both hands down and back hard (one, and); all spring high from that foot onto the other, at the same time swinging both hands up vigorously in front, chest high (two); hop on the supporting foot (and). (Meas. 4.) Same as Meas. 3.

"Half-Chain." (Meas. 5-8.) With three Morris steps finishing with a "jump" all dance a "half-chain"; Numbers One, Three and Five begin with the left foot, and during the first measure point diagonally upward and outward, about head high, with the left hand, and incline the head and body in the same direction. During the second measure they slowly lower the hand. During the last measure they swing both hands in the usual manner. Numbers Two, Four and Six at the same time start with the right foot and point with the right hand in the same



manner. The "half-chain" has now brought Number One to Number Five's original position, and vice versa, and the same with Numbers Two and Six.

B2. (Meas. 1-8.) All now repeat the "show and spring" and half-chain exactly as before, and this brings all the dancers back to their original positions, and the two sides facing each other.

2. "Half-hands."

A1. With the Morris step both sides advance and pass each other, each dancer moving a little to the left, so as to pass his opposite right shoulder to right shoulder. (Meas. 3-4.) Without turning around, all return to their positions with four "back" steps, and arms swinging from side to side as described in Meas. 3 of 1. (Meas. 5-8.) Repeat the same, but pass on the right this time, and in returning take only three "back" steps and finish with a "jump."

B1. "Show and spring" and "half-chain" as in B1 of 1.

B2. "Show and spring" and "half-chain" as in B2 of 1.

3. "Gypsies."

A1. (Meas. 1-4.) With exactly the same steps as in "half-hands" the two sides advance (3) one Morris step, until opposite dancers come face to face; then each moves to the left around in a small circle, still keeping face to face with opposite, and then retires with "back" step to his own position. (Meas. 5-8.) Repeat the same, but moving around in the opposite direction.

B1. "Show and spring" and "half-chain" as before.

B2. "Show and spring" and "half-chain" as before.

4. "Half-rounds."

A2. (Meas. 1-4.) Numbers Two, Four and Six quickly right about face, and all dance around in one large ring, moving from right to left, Number Six following Number Five and Number One following Number Two. The steps used are (Meas. 1-2) three vigorous Morris steps (Meas. 4), two "capers" first on the left foot, then on the right foot, at the same time turning outward and facing left about. (Meas. 5-8.) Dance around as in Meas. 1 and 4, but in the opposite direction, and at the finish of the last "caper" hold for a moment the final position of right foot raised and swing both arms vigorously forward.

CLAP DANCE—(Swedish.)

(Can be Danced by One Couple or a Circle of Couples.)

DANCE.—A. (Meas. 1.) Beginning with the outside foot, partners polka forward, at the same time swinging the joined hands backward and turning slightly toward each other. (Meas. 2.) With the inside foot polka forward, at the same time swinging the joined hands forward and turning slightly away from partners. (Meas. 3-8.) Continue to

polka, swinging the arms back and forward. (Meas. 1-8.) Partners dance "heel and toe" polka. At the end they release hands and come to a standstill, facing each other with hands on hips.

B. (Meas. 1.) In this position partners bow to each other, the man making an ordinary bow, and the girl making a peasant's bobbing curtsey (touch right toe behind the left foot and bend both knees) (one, and); return to erect position (two, and). (Meas. 2.) Each dancer claps hands three times (one, and, two); pause (and). (Meas. 3-4.) Same as Meas. 1-2. (Meas. 5.) Partners clap right hands together (one, and); each claps own hands once (two, and). (Meas. 6.) Partners clap left hands together once (one, and); each claps own hands once (two, and). (Meas. 7.) Partners each make a complete left about turn (one, and, two, and). (Meas. 8.) Partners, facing each other with hands on hips, make three stamps in place, beginning with the right foot (one, and, two); pause (and). (Meas. 1-4.) Repeat as in B (Meas. 1-4) before. (Meas. 5.) Partners with right elbows resting on the back of the left hand shake the right forefinger threateningly three times (one, and, two); pause (and). (Meas. 6.) Shake the left forefinger at each other in the same manner (one, and, two); pause (and). (Meas. 7.) Partners strike palms together (one) and immediately each makes a complete left about turn (and, two, and). (Meas. 8.) Partners, facing each other, make three stamps in place, beginning with the right foot.

The dance is re-



Step in the Komarinskala.

peated as often as desired. When danced in a circle of couples, each time it is repeated each man steps back and takes the girl next behind as a new partner.

HIGHLAND FLING—(Scotch.)

(As Danced by One or More Persons.)

I. (Meas. 1.) Touch right toe side right, hop on left. Raise right in back of knee, hop on left.

(Meas. 2.) Touch right toe side right, hop on left. Raise right in front of knee, hop on left.

(Meas. 3-4.) Repeat left.

(Meas. 5-6.) Repeat right.

(Meas. 7.) Break. Leap onto right foot and quarter turn right. Left foot in back of right knee. Another quarter turn right, left foot in front of knee.

(Meas. 8.) Quarter turn right, left foot in front of right knee. Facing front, left foot in front of right knee. One hand circled overhead, other on hip (side of active foot).

II. (Meas. 9.) Leap onto right foot sideways, left raised sideways. Left to right, right raised behind left knee, hop on right.

(Meas. 10.) Raise right in front of knee, hop on left. Raise right in back of knee, hop on right.

(Meas. 11-12.) Repeat right.



Steps in the Komarinskala.

(Meas. 13-14.) Repeat right, break right, turn right.

(Meas. 15-16.) Repeat same, left side.

III. (Meas. 1.) Touch right toe to right side, hop on left. Raise in back of knee, hop on left.

(Meas. 2.) Raise in front of left knee, hop on left. Leap onto right raising left in back.

(Meas. 3-4.) Repeat left.

(Meas. 5-6.) Repeat right and break.

(Meas. 7-8.) Repeat same, left side.

IV. (Meas. 9.) Leap to right outward. Raise left in back right knee, hop on right.

(Meas. 10.) Raise left in front right knee, hop on right. Raise left in back of right knee, hop on right.

(Meas. 11-12.) Repeat left.

(Meas. 13-14.) Repeat right and break.

(Meas. 15-16.) Repeat same, left side.

V. (Meas. 1.) Touch right toe diagonally forward, hop on left. Raise right to front of left knee, hop on left.

(Meas. 2.) Touch toe diagonally forward, hop on right. Raise left in front of right knee, hop on right.

(Meas. 3-4.) Repeat left.

(Meas. 5-6.) Repeat right.

(Meas. 7-8.) Break, turning right. Repeat, turning to original places.

VI. (Meas. 9.) Touch right toe to right side, hop on left. Leap to right and right raised to side right.

(Meas. 10.) Bend right knee and kick, hop on left.

(Meas. 11-12.) Repeat right.

(Meas. 13-14.) Repeat right.

(Meas. 15-16.) Break. Repeat whole to left.

VII. Touch right toe to right side, hop on left. Raise right in back of knee, hop on left.

(Meas. 2.) Touch right heel forward diagonally, hop on left. Touch right toe to standing foot, hop on left.

(Meas. 3-4.) Repeat right.

(Meas. 5-6.) Repeat right.

(Meas. 7-8.) Repeat, end with break.

VIII. (Meas. 9.) Stride jump. Raise left in front of right knee, hop on right.

(Meas. 10.) In front, hop on right. In back, hop on right.

(Meas. 11.) In front, hop on right. In back, hop on right.

(Meas. 12.) In front, hop on right. In back, turning to right.

(Meas. 13-14.) Right arm over four times, increasing tempo to finish.

KOMARINSKAIA—(A Russian Dance.)

(Can be Danced by One or More Persons.)

The Russian "Komarinskaia" is composed of an almost unlimited number of steps from which the dancer makes his own selection according to his ability or inclination. It is danced to the "Cerdetschni," a Russian folk song. The count is one, and, two, and.

FIRST STEP.—(Meas. 1.) With the left hand on the hip, right arm extended forward, palm up, and right leg extended forward, toes up, step forward with right foot, the heel touching the floor first (one), close the left foot to the right (and), step forward with right foot (two), raise the left leg forward, toes up (and).

(Meas. 2.) Repeat same, beginning with the left foot and swing-



Steps in the Hornpipe.

ing the extended right arm across the body toward the left, palm down.

(Meas. 3-8.) Continue alternating right and left and finish, arms folded, with three stamps in place. Left (one), right (and), left (two), pause. In executing this step move forward and around in a circle, returning to the original position where three stamps are made. The steps should be long and skimming, the arm should be swung laterally from side to side, the head thrown back and turned to the right, and the body turned from side to side in the direction of the swinging arm.

SECOND STEP.—(Meas. 9.) With the arms extended, step sideways with the right foot, at the same time giving a barbaric yell (one), step across behind with the left foot (and), step sideways with the right foot (two), step across behind with the left foot (and).

(Meas. 10-12.) Continue same, moving to the right, and finish with another step sideways with the right foot (one, and), stamp the left foot across in front of the right and extend both arms diagonally downward to the left (two, and).

(Meas. 13-16.) Repeat, beginning with the left foot and moving to the left, and finish with three stamps in place, arms folded—left (one), right (and), left (two), pause (and).

Execute this step as if running sideways, but without any up and down motion.

THIRD STEP.—(Meas. 1.) With arms crossed diagonally downward bend the knees, "sitting on heels" (one, and), extend the knees, at the same time springing to a stride position on heels (two, and).

(Meas. 2-8.) Repeat, and with arms folded finish with three stamps in place (one), (and), (two, and).

While executing this step, progress forward.

FOURTH STEP.—(Meas. 9.) With arms folded, head inclined to the right and right foot raised close behind the left knee, put the right foot down close behind the left foot (one), raise the left foot back of the right knee, inclining the head to the left (and), put the left foot down close behind the right foot (two), raise the right foot close behind the left knee, inclining the head to the right (and).

(Meas. 10-16.) Repeat and finish with three stamps in place (one), (and), (two, and).

Execute on the toes and as if walking backward with a springy step, and with exaggerated knee raising before each step. Take care to turn the knee out sideways in raising it.

FIFTH STEP.—(Meas. 1.) With the arms swung sideways and up slightly above the shoulder level, and the right leg extended and raised sideways, hop on the left foot (and—last count of preceding measure), step sideways with the right foot, at the same time swinging the arms down and across each other and giving yell (one, and), step across

behind the left foot, immediately raising the right leg extended sideways the arms sideways and up (two), hop on the left foot (and).

(Meas. 2-4.) Continue moving to the right and finish, arms folded, with three stamps in place (one), (and), (two, and).

(Meas. 5-8.) Repeat, beginning with the left foot and moving to the left, and finish, arms folded, with three stamps in place (one), (and), (two, and).

In executing this step, move sideways even on the hop. In swinging the arms down bend the body forward, and when the arms are swung up throw back the head and look in the direction in which the step is



Dance Steps Tending to Develop the Calves.

moving. Move impatiently and cover as much distance as possible.

SIXTH STEP.—(Meas. 9.) With the arms folded bend the right knee and sit on the right heel, extending the left leg forward, the heel touching the floor and giving a yell of exultation (one, and), change weight to left foot, sitting on left heel, and extending the right leg forward (two, and).

(Meas. 10-16.) Continue alternating and finish with three stamps in place (one), (and), (two, and), simultaneously with the third stamp extend the arms and throw back the head with an exultant yell.

In executing this step, move forward around in a circle, returning to place where the three stamps are made. The yell in the step occurs only twice—at the first movement and at the final step.

HORNPIPE—(English.)

STARTING POSITION.—Stand with feet together and arms folded, slightly raised.

I. "THE CIRCLE."

—Count "one, and, two, and."

A. (Meas. 1-6.) With arms folded and beginning with the right foot, polka forward around in a circle, moving from left to right, making one polka step to each measure. Finish at original starting point.

(Meas. 7.) Stamp the right foot in place (one); stamp the left foot in place (and); swing the right foot backward, brushing the floor with the toe



Type of Dance Movement Promoting Grace of Body.

(two); put down the right foot with the weight on it, close to and behind the left foot (and).

(Meas. 8.) Stamp on the left foot in place (one); spring up high from the left foot over onto the right foot, making a sort of hitch kick and alighting in the same place as before. This spring is made thus: Swing the right foot high forward and spring onto it in place, at the same time swinging the left foot high forward (and); put down the left foot in place beside the right foot (two); pause (and).

Throughout this entire figure the arms remain folded.

II. "TOEING."—A. (Meas. 1.) With arms folded, turn out both heels so that the toes are together (one, and); turn out both toes, and at the same time bring the right heel to the left toe (two, and).

(Meas. 2.) Turn out both heels again, so that the toes are together (one, and); turn out both toes, and at the same time bring the left heel to the right toe (two, and).

(Meas. 3-6.) Continue the same as in Meas. 1-2. (All during this step move forward gradually.)

(Meas. 7.) With a spring, alight on both toes with the feet close together, the right in front (one, and); with a spring change the position of the feet (two, and).

(Meas. 8.) With three quick springs change the position of the feet three times (one, and, two); pause (and).

Throughout the whole figure the arms remain folded.

III. B. (Meas. 1.) With the left hand raised and the right hand on the hip, hop on the left foot and at the same time touch the right toe to the side with the heel turned outward (one); hop again on the left foot, and at the



Simple Dance Movement of Body.

same time turn the right foot and touch the heel in the same place, with the toes turned up (and); hop again on the left foot and at the same time touch the tip of the right toe close to the left toe (two). Hop again on the left foot, and at the same time extend the right foot high to the side (and).

(Meas. 2.) With the arms in the same position, put down the right foot close behind the left foot (one); make a short step to the side with the left foot (and); bring the right foot to the left foot (two); pause (and).

(Meas. 3-4.) Repeat all as in Meas. 1-2.

(Meas. 5-8.) Repeat the same as Meas. 1-4, but this time with the position of the arms changed and beginning with the left foot. During this figure the arm positions are the same as described in the first step of the Highland Fling, page 1108.

IV. "HAULING IN THE ANCHOR."—B. (Meas.

1.) Make a vigorous spring to the right, alighting on both feet together, and at the same time bend the body far forward, reaching down with both hands opened, as if to grasp the rope (and); close the hands as if grasping rope, and begin to raise the body erect, as if pulling it up (and); slide the left foot back and bear the weight on it, leaving the right foot forward and the toes raised, and at the same time lean backward over the left foot and pull both hands back over the left shoulder as if giving a vigorous haul to the rope (two); pause in this position (and).

(Meas. 2.) Repeat the same, but spring to the left, and pulling over the right shoulder.



Vigorous Classic Dance Movement.

(Meas. 3.) Repeat the same, but springing to the right, and pulling over the right shoulder.

(Meas. 4.) Repeat the same, springing again to the right.

(Meas. 5-8.) Same as Meas. 1-4, but beginning with the spring to the left.

During this figure the dancer moves gradually backward.

V. "HOISTING SAIL."—A. (Meas. 1.) Looking upward, with the hands raised and open as if to grasp the rope (the right high over the head, the left at waist), hop on the left foot and at the same time touch the right toe close to the left toe (one); hop again on the left



Simple phases of Classic Dance Movements.

foot, and at the same time touch the right heel (with toes raised) to the left toe (and).

During counts "one, and," close the hands and pull straight downward until the right hand is at the waist.

Repeat the same, using the opposite hand and foot (two, and).

(Meas. 2-6.) Continue the same as Meas. 1.

(Meas. 7-8.) With arms folded, finish with two slow and three quick foot changes as in Meas. 7-8 of II.

VI. "HITCHING THE TROUSERS."—A. (Meas. 1.) With the right placed with the palm against the waist in front, and the left with the palm out at back of the waist, slide diagonally forward to the right, with the right foot, and raise the left well up backward with the knee extended (one); in this position, hop on the right foot (and). The action during "one, and" should be in imitation of a sailor's way of



Movements Common In Classic Forms
of Dancing.

"hitching up" trousers. Put down the left foot in place and at the same time raise the right foot high diagonally forward (two); in this position hop on the left foot (and).

(Meas. 2.) Put down the right foot behind the left, bearing the weight on it (one); step sidewise with the left foot (and); put down the right foot in front of the left, bearing the weight on it (two); hop on the right foot (and).

(Meas. 3-4.) Repeat same as in Meas. 1-2, but reversing position of the arms and starting with the left foot.

(Meas. 5-6.) Same as in Meas. 1-2.

(Meas. 7.) Slide the left foot to the side and begin to twist the body to the left, with the right leg raised backward (one, and); hop on the left foot and at the same time turn about to the left, facing front again (two, and).

(Meas. 8.) With arms folded, make three quick foot changes in place as in Meas. 8 of II.

VII. "PAYING OUT THE SLACK."—B. Meas. 1-2). With the shortest and quick est steps possible, run (on the



Exercise Movements Tending to Develop Flexibility of the Body.

heels with the toes raised) diagonally backward to the right, at the same time making motions with the hands, as if paying out the slack of a rope.

(Meas. 3-4.) Continue the same, but moving diagonally backward to the left.

(Meas. 5-6.) Same, moving diagonally backward to the right.

(Meas. 7-8.) With arms folded, make two slow and three quick foot changes as in Meas. 7-8 of II.

B. (Meas. 1-8.) Repeat the whole figure, starting diagonally backward to the left.

VII. "ROCKING."—A. (Meas. 1.) With the arms folded touch the left toe directly in front of the right toe, and immediately let the left heel sink so that the foot is flat on the floor. At the same time raise the heel of the right foot so that just the toe is touching the floor behind the left foot (one, and); rock the weight back onto the right foot, lowering the heel so that the right foot is flat on the floor again, at the same time raise the left heel so that just the toe is touching the floor (two, and).

(Meas. 2.) Rock the weight forward onto the left foot again as before (one, and). (This "rocking" is done without ever lifting the toes from the floor.) Hop on the left foot and at the same time raise the right foot sidewise (two, and).

(Meas. 3-8.) Continue same "rocking" steps.

A. (Meas. 1-4.) Continue "rocking" steps.

(Meas. 5-6.) Continue "rocking" steps, at the same time turning once around to the right in place.

(Meas. 7-8.) With the arms hanging loosely at the sides, make the same finish as in Meas. 7-8 of I.

IX. B. (Meas. 1-8.) Repeat I exactly as before, and finish with the right-hand salute on the last beat.

CHAPTER IX.

VOCAL CULTURE.

THERE is beauty of sound as well as of sight. There is color in tone as well as in light. But there is no other sound with the charm of the human voice at its best—resonant, rich and sweet. And when art has been extended to its farthest limits, there is still no other music like that of the song well sung.

Some among us, very fortunately gifted by Nature with great vitality, pleasing features and agreeable voices, need do very little except to maintain good health and physical vigor in order to retain these charms. With the rest of us, it is often necessary to adopt special measures for bringing about a sadly needed improvement in these matters, and it is just as possible for every man and woman to build up and enjoy a beautiful voice as to develop a beautiful, vigorous body. Indeed, need of the latter as one of the prime conditions of the former is one of the most important points on vocal culture which we wish to point out here.

This fact, that a pure-toned, rich and resonant quality of voice depends fundamentally upon a robust development and condition of body, is especially to be emphasized here, because it is so generally neglected elsewhere. It is a matter of universal observation that great singers of both sexes are universally men and women of robust physique and at least normal physical vigor. Perhaps in most cases this is not so much the result of special training along physical culture lines as of having been born with a powerful constitution.

It is not essential for purposes of vocal culture that one develop the external muscular bulk of a Hercules, but he is not likely to have the lung power and the desired chest development if he does not have at least a normal and vigorous body throughout. And just as the weakling must develop and round out his entire body before he can hope for anything like a living voice, so the possessor of an ordinarily good singing voice

may greatly improve its tone, timbre and power by general methods of physical development. One would not expect good tone from a violin, the body of which is defective, no matter how well versed in musical technique the player might be. We should expect the instrument to be as perfect in every way as possible. In the case of the human voice, the instrument by which it is produced should be as perfect as possible, and physical culture is therefore an indispensable factor in vocal culture.

In speaking here of the importance of a good chest development, it must not be understood that chest breathing is referred to, for that would be fatal to good singing. A full chest development is necessary not only to provide plenty of room for the lungs, so that there may be an ample supply of the residue air even after exhalation, but especially because of the function of the sternum or breastbone in giving resonance to the voice. It acts somewhat like the sounding board of the piano or a violin, and that is why good singers always have good chests. It does not matter how much force is used, for nothing but a weak voice can be produced with a sunken chest, whereas the tones will be strong and vigorous, and without effort, if the chest is full and robust.

Diet is also a most important factor in vocal culture for the very reason that, as already stated, the condition of the body and of the health has everything to do with good voice production. The vocal cords and the air passages concerned must be free from irritation and catarrhal disorders, and errors of diet has so much to do with such conditions that too much care in this direction cannot be taken.

It may be said in a general way that diet applies to vocal culture as it applies to athletics, namely, that what is best for the general health and the body as a whole is also best for the specific purpose in mind. There is no special food that is of exceptional value for the voice, except as it may be of exceptional value for the all-round nutrition of the body and for producing a pure and wholesome quality of blood.

If our throats and heads are foul with catarrhal discharges,

we have taken into our systems something that Nature does not want or too much of something she does want. Enlarged tonsils are often removed by surgery for a big fee, both operator and victim being in seeming ignorance of the fact that they are depurating organs and would not be enlarged had they nothing to depurate. Hoarseness, laryngitis and kindred ailments, the result of local inflammation, are, when not caused by overwork, signs of a wrongly fed system—of stimulating, irritating foods long continued. No rightly fed person need fear them.

Unfortunately the singer is, no more than others, exempt from the tyranny of the M. D., and his supreme factotum, the specialist. He has been taught to believe that he must “take something” for his voice; he eats unsparingly of ill-assorted foods at ill-appointed times, along with his equally ill-advised friends, and relies upon the beguiling cough drop or other opiated dope for colds, coughs and hoarseness; he swallows two raw eggs, sucks a lemon and gargles with listerine.

At the very outset the first thing you must learn is that a clean system and a clear voice are not so much the effects of what you eat and drink as they are the happy consequences of your having *left out* of your diet those things which Nature does not want. In short, your aim must be to learn what, how and when *not* to eat—the search for “something to clear the voice” should be superseded by a careful, thorough, self-denying elimination of those foods and drinks that clog the system and, consequently, the voice. And you will find that, after the eliminative process has been carried to its proper end, your diet will consist of just enough of good, pure food to rebuild the everyday wear and tear of functional processes and mental and physical activities; and such an amount will seem, in comparison with what you are now eating, ridiculously little.

Colds affect the voice primarily at the throat; acutely as hoarseness, chronically as laryngitis. Pharyngitis (chronic sore throat) does not directly affect the voice, but may do so indirectly through inflammation of the soft palate, uvula and

fauces, thus decreasing the size of the pharynx, which is a resonating chamber. Voices are most affected by hoarseness in the lower or chest registers. Thus basses and contraltos are more completely disabled by it than are the higher voices. Be the hoarseness ever so severe the upper mixed tones and the head tones are not seriously impaired by it. If the cold be "in the nose" the nasal resonance is clouded or dead, and the tenor cannot "appear"; if "in the head" the soprano has lost her best tones and the brilliancy of her entire voice and must disappoint her audience.

Nature, if permitted, will, in an incredibly short time, remove your "cold," cure your hoarseness and restore your voice to its normal efficiency. If you continue without a halt the same habits which made the "cold" a necessary move of Nature the conditions become chronic and you have catarrh or laryngitis. If you continually take in superfluous or poisonous matter, Nature must, in order to save you, continually throw it off—you *must* have catarrh. Neither drugs, nasal douches nor inhaled medicated fumes will cure it. The mouth, having no excretory membrane nor glands, shows no inflammation during colds and catarrhal conditions, and those singers who have been taught to force every tone to resonate "in the mouth" are least liable to disability from colds. Treatment for colds and catarrhal conditions will be found in other parts of this work.

A vitally important condition of good singing is an empty stomach, and one who is wise will never attempt to sing at any other time. The chief reason for this is obvious in the fact that the full stomach interferes with the perfect breathing and the control of the breath essential to good voice production. The diaphragm is hindered in its action, and this part of the body is generally so crowded that even the attempt to sing is attended with more or less distress. Furthermore, the voice itself is not so clear just after eating, unless one has eaten practically nothing. The work of digestion calls for such a large supply of blood to the stomach that the circulation in the throat is likely to be less active, and sometimes the voice is more or less thick

or husky as a consequence, this disappearing with an empty condition of the stomach. One should not sing or use his voice for prolonged public speaking for at least four hours after a meal, and it is better to use it six or eight hours after.

The two meal per day plan is not only the best, but practically the only plan by which the professional vocalist may always appear "in good voice." It is not only the best plan for promoting the highest degree of health in most cases, but it permits of a perfectly empty stomach when singing in the evening. The arrangement should be that of breakfast and dinner at noon, rather than the no-breakfast plan with an evening meal. If the dinner is eaten at one o'clock or at any time in the early afternoon, the voice will be clear as a bell when the time comes for its active use.

While speaking of the physical requirements of the voice, and its relation to the condition of the body, it may be said that a condition of warmth of the entire body is always favorable to good intonations. Perhaps in saying warmth we should have said an active circulation. But this is associated with the natural warmth of the body. If chilled, or still shivering from previous exposure, it will be impossible for you to sing or to speak and do justice to your voice, for it simply will not respond. Under such circumstances, if compelled to speak or sing in public, radical means of regaining the vigorous warmth of the body should be adopted, so that the circulation in the air passages will be active and the voice clear.

The production of voice is accomplished by a truly wonderful mechanism. As everyone knows, voice is produced primarily by the vibration of the "vocal cords," consisting of a pair of lips stretched across the air passage into the lungs, these lips being open in ordinary breathing, but being caused to vibrate by the escaping breath when drawn more closely together. These vocal cords, however, can accomplish little without the other parts of the instrument, including the breathing apparatus and the resonance chambers of the larynx, pharynx, mouth and the nasal cavity, which may be known more advantageously as the naso-pharynx. This initial sound

produced by the vibration of the vocal cords is a very faint one, but because of the fact that it is reinforced and multiplied by the resonance of these air chambers it emerges with the full sound of the voice as we know it. It is as in the case of the violin, in which the vibration of the strings themselves does not generate much sound, but in which the reinforcement of the sound by the air of the box, set in vibration by the vibration of the string, produces a round full tone that will fill a large building. It is also like the case of the trombone or other brass instrument, in which the sound is multiplied by the megaphone character of the end of the instrument.

The larynx is a cartilaginous cavity forming the upper part of the trachea, or windpipe, and it is in this that the vocal cords are situated, stretching across forward and back just under the epiglottis. There are nine cartilages in the larynx, three single, (the thyroid, cricoid and epiglottis), and three pairs (two arytenoids, two cornicula laryngii, two cuneiforms.) These are all connected by ligaments and moved and controlled by a host of small muscles. The interior of the larynx is lined

with mucous membrane. The thyroid is the largest of these cartilages, consisting of two alæ, each of which forms a side of the larynx, and when joined together these form a triangle, the apex is familiar to everyone under the name of the "Adam's apple." The cricoid cartilage, located just beneath the box formed by the thyroid, is not unlike a signet ring, with the important part, that representing the signet, behind. The "arytenoids" (The Greek for pitcher), are so



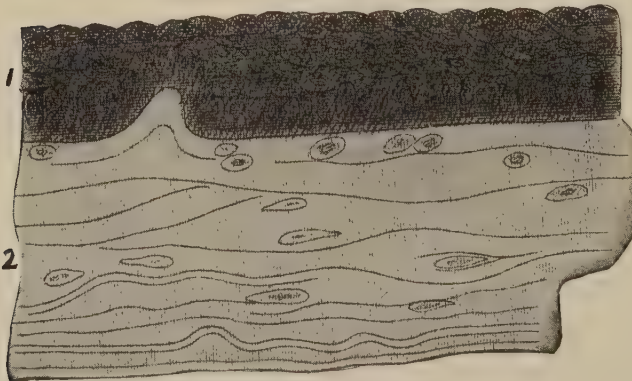
Photograph Showing Larynx During Delivery of a Very High Note.

1. Roof of tongue.
2. Fold from tongue to epiglottis.
3. Epiglottis.
4. Inner projection of the epiglottis.
5. Wall of the pharynx.
- 6-7. Opening of larynx.
8. Vocal cords.
9. False vocal cords.
- 10-11. Small protuberances.

named because they resemble the mouth of a pitcher when brought together. They are small triangular bodies placed on top of the cricoid, in the upper part of the signet portion of the latter, and are important because they are movable and because the vocal cords are attached to them.

The larynx is the origin of the voice in all cases, and such terms as "head-voice" and "chest-voice" are somewhat misleading, for the vibration in all cases is generated by the breath acting upon the vocal cords. The so-called registers of the voice refer to tones of a like quality produced by the same adjustment of the vocal cords, and they should really be given names which describe them more accurately than "head" or "chest" voices, etc. The so-called "chest-voice" is produced by the vibration of the full length of the vocal cords, reinforced largely by vibration of the air in the cavity of the chest, while the "head-voice" or falsetto is produced by the vibration of only a part of the vocal cords, these being so forced together at their posterior ends as to permit only the open portions of the forward ends to come into play, the sound being reinforced by the resonance of the upper cavities, or in other words, the mouth and bony cavities of the skull. Those who think they "feel" their head notes coming from the forehead, or the back of the nose, are mistaken, for they all originate in the larynx.

Briefly, then, the power which produces the voice is the breathing apparatus, particularly the

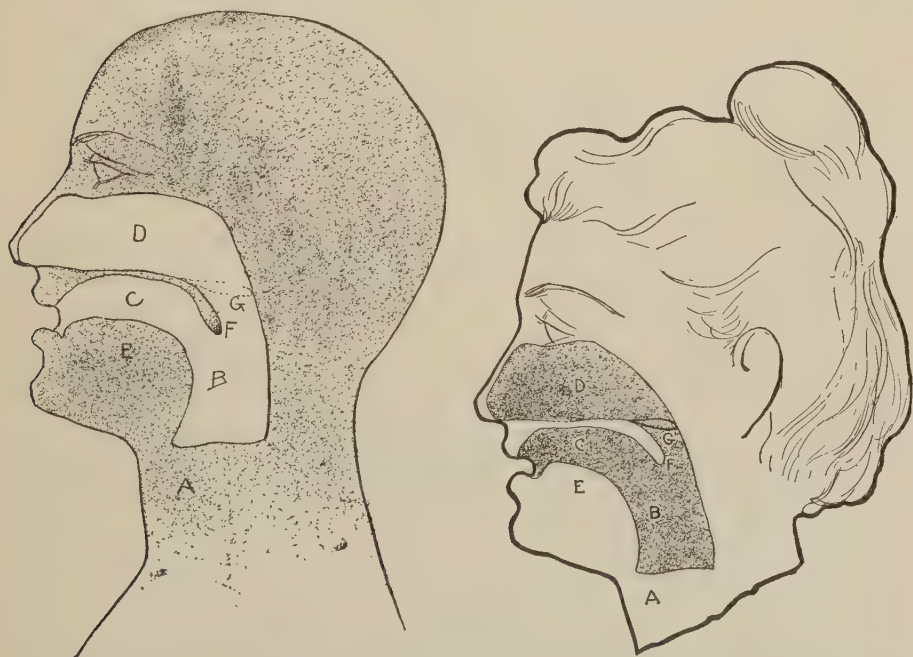


Section of the Mucous Membrane of a Vocal Cord.
(Very much magnified.)

1. Surface of flat cells.
2. Elastic fibers.

diaphragm, the vibration is generated in the larynx by the vocal cords, and the quality of tone after this depends upon the expansion and resonance of the upper air chambers,

upon the manner in which the tone is directed past the teeth and lips, and to a certain extent upon the chest and its formation, as already said. The first, and all important factor, however, is the power and its control. Without this breath control, and absolute freedom in breathing, good voice production is impossible. The various breathing exercises which the physical culturist has been accustomed to will therefore be of great value in this connection, and if one has not yet made a practice of such breathing exercise, then I would refer him to the special exercises of this kind illustrated elsewhere in this work. But in taking such preparatory breathing exercises, I would ask that the student place his hands not only upon the stomach, in front of the waist, to see that it expands properly with inhalation, but in turns also upon his sides and also upon his back, to see that the expansion of the body extends to the sides and also backward in each inhalation. For only under such complete expansion of the body backward, sideways



Profile of head showing resonance spaces. B. Pharynx. C. Mouth. D. Nasopharynx. F. Uvula in position for normal tone. G. Soft palate raised, cutting off resonance of naso-pharynx. E. Tongue. A. Point at which initial tone is formed. It will be noticed that in the cut at the right the resonant spaces of the pharynx and above the back of the tongue are entirely open.

and forward, at the waist line, is the diaphragm acting correctly. This is essential to good singing and the breath control that it depends upon. And what applies to singing also applies to the correct formation of voice in speaking.

In addition to the ordinary breathing exercises for breath control, it is well to practice a special exercise for refilling the lungs in the momentary pauses permitted when singing or speaking. Under such circumstances, there is no time for the long inhalation through the nose. It must be through the lips, and is accomplished by a quick "gasping-like" action of the diaphragm. Having exhaled completely, fill the lungs almost in an instant with a gasp, expanding the body at the waist line only. The lungs will not be entirely filled, for this is not desirable for the best vocalization, but the deeper parts of the lungs will be supplied with air in this way. This should be practiced assiduously, until you can do this without any suggestion of strain or effort, and you will then never get out of breath either in speaking or singing.

Remember that it is not force that makes a voice powerful, but control of the breath. Violent expulsion of the breath cannot accomplish any good in giving volume to the voice, and can only strain the vocal cords. In all things connected with the voice, there must be no strain of any kind. It is often said that it is hard to sing, but this is not because there is any physical effort or exertion required. It is rather because of the mental difficulty of control, or the difficulty of restraining



A good position for first vocal exercises. Lie flat on the back and practice breathing, one hand over the stomach to see that the body expands at the waist line when inhaling, and contracts when exhaling, or as you sing your vocal exercise.

the tendency to exertion or strain. Everything must be natural and easy, the only place where there may be any stress at all being at the waist, in the action of the diaphragm. But even this should not be appreciable when the muscles concerned are properly developed.

In order to acquire the general relaxation of the body, or as we would better say, the freedom from tension necessary for perfect tone production, it is well to commence the practice of breathing exercises and some vocal exercises by lying flat on the back. In doing so one hand may be placed over the stomach to assure yourself that you are breathing properly. After you can do these exercises, and especially the first vocal exercises upon the back without tension, then you may practice them in the standing position.

The position of the body is a most important one, and it scarcely needs to be said that an erect carriage of the body is the essential thing, though without strain. I would especially refer the student to the discussion of "Carriage" in Chapter VII, on *Physical Training for Women*. The same general rules for carriage will apply in speaking and singing, except for the emphasis that there must be no stiffness or tension. For this reason the position of feet together is not recommended, but rather a position with one foot a little in advance, the weight resting upon the forward foot, preferably upon the ball of the forward foot. In leaning forward, the swaying should be done from the ankles. The chest should be well up and forward, the abdomen consequently restrained, but all this without strain or tenseness, so that the muscles about the waist may act freely. It is perhaps unnecessary to say anything here about the matter of dress or the use of the corset in women. It is obvious that any constriction about the waist, of any kind, must interfere seriously with the production of the voice. This proper position of the body is necessary for two reasons, namely, that the chest may be in a position to aid in the most perfect resonance of the voice and also that the breath may be properly controlled. Even in the expression of tones of great volume, very little breath is required.

Having the physical foundation and health necessary for a good voice, having the proper position and the breath control, there remains the important matter of the placing of the voice, upon which the quality of the tone depends. This is a matter about which there has been much difference of opinion among experts, and about which entire books have been written in technical jargon. The importance of the question is indisputable, however, for every one knows that many beautiful voices have been ruined by methods taught by the most high-priced teachers. Surely, when one pays \$6.00 a lesson for vocal instruction, he or she expects only the best results, but in some instances there is just as much danger of ruining the voice in seeking the tutelage of some such "master" in a far-away land as of going across the street and paying fifty cents a lesson. We cannot here take up the pros and cons of the placing of the voice, but wish to offer briefly the "first principles" upon which a good voice depends.



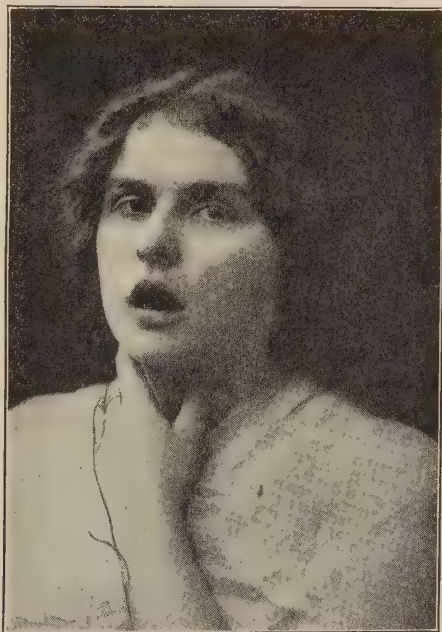
Muscular contraction of face, uplifting features, very common among singers. This tends to induce the contraction of the throat as well through sympathetic action of muscles, and should be carefully avoided.

The complete relaxation of the throat and throat muscles is the one first and greatest essential of the perfect tone. Above all things, let there be no squeezing of the throat. Rigid muscles here are the cause of harsh tones in both speaking and singing. As we have said, the sound and the pitch originate in the larynx through the vibration of the vocal cords, but the timbre and quality of voice is determined chiefly by the resonance of the hollow spaces above. If these hollow spaces are unchanged, the tone will be natural, but any contraction of the

muscles of these parts, and especially of those of the throat, will cause some of these spaces to close up more or less, and others to change their form, so that the tone will be anything but pleasing. These spaces must be kept open, and the first principle of good vocalization is to avoid making hard work of it, to avoid any exertion of any of the throat muscles, but on the contrary to keep them absolutely relaxed. *The pure tone is the tone that is made without effort*, and if your vocal instruction does not proceed in accordance with this fundamental condition, then there is something wrong. It is in this respect that a great many vocal teachers and pupils go wrong.

The expression of the face, with uplifted features, shown in illustration on page 1130, is a common one among vocalists, this muscular contraction of the face also inducing more or less contraction of the throat muscles, and rendering good tone impossible. By placing the thumb and fingers upon the throat very gently, feeling the "Adam's apple" and adjacent parts, this muscular contraction and also the movement of the thyroid cartilage can be sensed very plainly.

To make sure of the complete relaxation of all of these muscles, and thereby insuring the open and unchanged condition of the resonance chambers, the student should at first practice most singing exercises with thumb and fingers on the throat. To secure this relaxation most completely, it will help to relax all of the features of the face as well, letting the jaw drop loosely and assuming as much



Relaxed features, an aid to securing relaxation of throat and throat muscles, allowing resonance cavities to be open wide.

of a drowsy expression as may be necessary for the most absolute freedom from tenseness of all parts. The illustration on page 1131 gives a good idea of the mental attitude necessary. In this position, sing a soft tone, without consonants—just a mere vocalization. There will be vibration, but there should be no rising of the cartilage, no tightness or contraction of the muscles. It may help you in this if you will remember that there should be no rising of the back of the tongue in the mouth, such as takes place in swallowing. After you can get this relaxation while singing simple vowel sounds, then you can proceed with other singing exercises. It is a mistake for anyone to try to sing songs without such preparation as is necessary to master the essentials of perfect tone production, and without a thorough course in such exercises as are offered here, together with plenty of practice in scales.

For helping to acquire this relaxation of the throat and also for developing resonance of the upper chambers, humming is an ideal exercise and should be much practiced every day. This should be started very softly, without any constriction of the throat, and gradually allowed to become a little louder. Practice humming in various keys. A very good exercise for the purpose is to imitate the sighing of the wind, with various fluctuations of pitch, since this is exceedingly effective for developing the resonance of the naso-pharynx. Practice other humming exercises with mouth closed and with it open. Say the syllable, "ing," a humming noise that should come out of the nose on the breath, which may be felt slightly by the fingers placed under the nostrils. Place the thumb and forefinger upon the bridge of the nose in this exercise so that you can feel the vibration in the nasal chambers and be sure of executing it correctly.

To avoid throatiness one should avoid the feeling that he is singing in his throat. The ideal tone is that which proceeds unimpeded through the open spaces of the larynx and mouth and is directed forward against the hard palate in the upper forward part of the mouth, or, as one might say, toward the upper teeth. One should think of this in singing his exercises

until he has so thoroughly established this forward placing of the voice that he will continue it naturally and without further conscious thought. One of the most perfect of all exercises for attaining this forward placing is the practice of singing the word "Noon." This will naturally bring the voice forward as desired. It should then be varied by singing, "nan," "neen," "nahn," etc.

No attempt at the use of consonants should be made until after one has mastered the singing of pure vowel sounds, and these should be sung with mouth open freely, but without the strain that comes from forcibly opening the mouth too wide. The broad "a" (ah) sound will require the mouth well open. Instead of practicing the pure vowels without consonants, however, it will usually help in the proper forward placing of the voice to use the consonant "l," and always making sure that there is no constriction of the throat or tightening of the muscles there. It must not be hard work, except in the way of mental application, and the less mental stress the better for the bodily control. It is best in the beginning to practice only a few minutes at a time, and perhaps several times each day. Sing on the various notes of the scale, accompanied with chords on the piano, if convenient, "La," "Lay," "Lee," "Lo," "Loo." It will also be well to vary this by changing the vowel sound all in the same tone, as "La-a-ee-o-oo." Following this may come other singing exercises of the same character, as taught



Correct standing position for singing or speaking, weight on forward foot. Practice of humming exercise with fingers on bridge of nose to feel vibration of nasal cavities.

by instructors of the Italian method, or similar methods, together with scales, etc. Up to this point, however, the suggestions given here are just as valuable for those studying to improve the voice for purposes of elocution, public speaking or pleasing conversation.

There is one exercise that is especially to be recommended both for breath control and for assurance in regard to the necessary ease of tone production. That is the practice of sustaining a tone on one breath for some time, and can advantageously be practiced in conjunction with a piano. Time yourself with a watch, take a fairly good breath, but not a forced one, strike a chord and sing the tone, "Ah," or any other vowel desired, or varying the vowel if preferred. The tone may also be varied in volume, for both loud and soft tones should be made with the greatest economy of breath, or, in other words, with the strictest breath control, holding it as long as comfort will permit, and then, after two or three intervening breaths, repeating the exercise on the next note up the scale. In this you should sustain each note from twenty to forty seconds, though it is not unlikely that before long you may sustain each note for more than one minute on the same breath. However, you will then be sure of breath control and of ease in vocalization, and the voice will roll out in all its fullness and resonance.

I am presenting in connection with this chapter a song that I myself have composed. I was very much impressed with Haydn's "Creation," and after singing it for some time I thought that if appropriate words were adapted it would make a splendid physical culture song. I provided some words to suit the harmony of this composition, but afterward found it advisable to make some slight changes in these words and of adapting a new air to accompany them. The song, as it now stands, has not the jingle that would perhaps gain for it popularity; it has not been written for that purpose. Rather is it intended for those who have given considerable time to vocal culture and who can put unusual feeling into their vocal efforts.

While the subject of vocal culture cannot be treated here as fully as in a book on the subject, yet some of the vital and fundamental factors of good voice production are suggested in the foregoing pages, and will doubtless be of value in connection with personal instruction from teachers.

MANHOOD GLORIFIED

SONG

Words By
Bernarr Macfadden
Maestoso

Music Adapted by
Bernarr Macfadden

The

world re-sounds, de-mand-ing human

glory The cry for health pre-

vails throughout the land While grov-ling through life's

mire Seeth not the strength, grace and

Detailed description: This is a musical score for a song titled 'Manhood Glorified'. The score is written for a vocal line and a piano accompaniment. The key signature has two flats (B-flat and E-flat), and the time signature is 4/4. The tempo/mood is marked 'Maestoso'. The lyrics are: 'The world re-sounds, de-mand-ing human glory The cry for health pre-vails throughout the land While grov-ling through life's mire Seeth not the strength, grace and'. The piano part features a strong, rhythmic accompaniment with many chords and some melodic lines. The vocal line is simple, with lyrics written below the notes. There are some performance markings like 'ff' (fortissimo) and 'v' (accent) in the piano part.

poise offered to all men.

Thy head hold

up, and claim thy divine kingship, For thrones of mighty strength a

wait thee Claim thine heri- tage, tingling with pow'r, And

broadly--- rit ---
like a roaring lion fight, For manhood's great re-

wards.

CHAPTER X.

BEAUTY AND HOW TO ATTAIN IT.

NEARLY every one looks upon beauty as an extraneous "something." Here is a quality which is in the greatest measure a physical endowment, yet the average woman casting about for means of cultivating it never for one moment seeks for its acquirement through physical means.

All sorts of devices and medicines and complicated and costly methods are followed by the beauty-seeker as though beauty were bestowed in about the same fashion that a poster is slapped on a billboard. Gazing at the stars, she sees not what lies to her hand. For beauty, poetical though its conception may be, has its root in prosaic ground. The same factors which build up flesh and blood, bones, muscles and nerves of the body are the architects of beauty. Beauty is of the body and not apart from it, and its builders are those processes which maintain bodily health: breathing, eating, drinking, exercise, bathing and sleep. Its acquisition does not depend on chance, but its development lies within the control of each one of us.

In early Greek history, when there was free intermingling of lightly clad boys and girls in sports and dances, and to a certain extent in athletic exercises, the love relations of the sexes were ideal. Seduction and adultery were so rare that instances became notable historic events. It was only in later times, when the Greeks denied to their girls the intellectual education accorded their boys, and the young men sought for companions either among themselves exclusively or among brilliant foreign women, that licentiousness began to prevail. Then it was, too, that the Greek maidens began to lose the beauty for which they had been famous, and degenerated into household drudges, and querulous mothers and wives, of which Xantippe, the scolding, unattractive "help-meet" of Socrates, was the type.

Now, man is the creature of natural conditions. What he has been in the past, he can be, if not in the present, in the very near future. It is entirely possible, if we but obey the laws of Nature, within a generation or so to restore the race to the pristine beauty of early Greece. Through the great development of physical culture among our young men and women, and the increase of wholesome companionship between the sexes, there is promise that there will shortly be produced a type of humanity that shall equal in physique any the earth has yet brought forth, and in mind and soul shall set a new standard for the race. It is particularly the duty of the girl, as at present the less free of the sexes, to fit herself properly to function as the mother of this regenerated people. And in so fitting herself she will receive an advance payment of that beauty and joy which are the rewards of ideal motherhood, in the form of girlish charm and happiness, the sure indexes that she is fulfilling rightly her part in the plan of Nature.

In the first place, she must fill herself with the joy of life and work and helpful companionship.

She must, like the Greek girl, live according to Nature, spending as much of her time as possible in the open air and sunlight, and aiding their beneficial effects on her body by wearing no more clothing than necessary. Let her run hatless over the fields, clad in loose and airy garments; let her paddle her feet in the brook, and plunge, like Galatea into the surf, a white embodiment of the spirit of the spray. Let her enter with zest into household employments, considering such work as play; let her join in sports and games with boyish companions, demanding no privilege because she is a girl, but never forgetting to be womanly. Let her eat, like Ceres' daughter, simple and natural food, the grains and fruits of the earth, and quench her thirst at its springs, for by so doing will she reduce to a minimum the pains and penalties imposed upon the sex for its violation in the past of natural laws.

By such a life she will inevitably develop into a beautiful

woman, attractive to all clean young men as a companion and playfellow, and to one of them who is complementary to her in mental and physical characteristics, as a wife. There will be no need to pinch herself in at the waist in order to give her bust and hips the appearance of ripening womanhood, for these will develop naturally and normally as the buds in spring and the fruits in summer. Her complexion will not require the artificial aid of toilet preparations, for beneath her skin will pulse pure blood of a bounding vitality that is produced by a simple, natural diet, which will conspire with wind and sun to "hang out beauty's crimson ensign" upon the lips and cheeks and charm the eyes of all beholders.

If, through her health, a girl can control her general attractiveness, she need not be concerned about minor details, such as the color of her hair or eyes, the size and shape of her nose, the tilt of her chin, or any other inherited characteristics. A fine personality, which is the natural accompaniment of a healthy, thoroughly developed body, can reform any feature or collection of features, endowing it with charm. Remember that the beauty of the whole transcends that of any part.

Therefore it is that men are often at a loss to explain why they consider a certain girl beautiful. Analysis of her features does not help them out. What has really attracted them is simply good health. Rosy cheeks, rounded limbs, an alert manner and a happy disposition—all the result of natural living—give that personal charm which all women desire, and to acquire which many are willing to submit to tortures even.

Yet only a little self-denial (which quickly becomes a pleasure) is required of a girl who would make herself attractive. When the terms "beauty" and "health" become synonymous in her mind, to attain her object she will be willing to sacrifice some pleasures of the lower senses—such as comes from the eating of chocolate creams, the absorbing of unlimited ice-cream sodas, lobster and oyster suppers, and

rich animal food in general. She will then no more dream of swallowing harmful things than of wearing an unbecoming dress, or a hat which does not harmonize with her hair or complexion.

Nor will she be content with negative requirements alone. She will inaugurate a system of exercise of at least ten to twenty minutes daily, followed by a cold bath, in addition to her walks and outdoor pastimes, for this is the best of all practices for keeping the blood pure and the internal organs clean and in perfect working order. Every famous beauty and every actress celebrated for her personal charm know this secret, and they faithfully persist in these morning exercises and cold baths for the sake of the resultant youthfulness and beauty that these impart to face and form.

BATHING.—'Tis a trite phrase that cleanliness is the handmaiden of beauty, and the first office of the bath is to clean. The skin is one of the organs by means of which the body is relieved of waste. Its depurating action is unremitting and thus there is constantly exuded on the surface waste matters. Hence, unless frequently bathed, the skin suffers in appearance, firstly, by reason of its uncleanness; secondly, becoming clogged up, the wastes are not readily eliminated from the blood, which becomes impure. In consequence, the whole system suffers, the skin taking on a yellowish tinge, and the complexion becoming dull and sallow and coarsened by enlarged pores.

But, perhaps, one of the most valuable of baths for the skin, one that never fails to improve its texture and color, is a bath that does not require water—the friction bath. It stimulates the circulation to the skin and thoroughly cleanses it. The friction bath is self-applied by the use of soft, bristled brushes. Beginning at the forehead, the face and neck are thoroughly brushed, then each arm in turn (working upward from the hand to the shoulder), then using both brushes together, the shoulders, chest, sides, abdomen, back and lastly the legs, brushing from the ankles upward. The treatment is continued till each part of the skin is in a glow. It will be

hard to reach the back of the body, but do the best you can. When taking the friction bath for the first time, it will be necessary to avoid vigorous brushing and not to continue the treatment very long, as in the beginning the skin is easily irritated, but as the treatment is continued from day to day, the skin becomes accustomed to it, and it may be made as vigorous as desired. The friction bath will put one's skin in splendid condition, and it will not be possible for pimples, blackheads, or other eruptions to develop when the friction bath is a regular practice. The ordinary Turkish towel may be used for the friction rub instead of the brushes.

For a complete discussion on baths for cleanliness and for building health and beauty the reader is referred to the chapter on Hydrotherapy in Volume III.

Face, Washing the. Absurd as it may seem, it is nevertheless necessary to instruct the average person when and how to wash the face. From at least those days when Shakespeare's schoolboy, "with shining morning face" crept like a snail unwillingly to school, it has been the custom to wash the face regularly on arising from bed, and rarely before retiring. The practice should be just the reverse. The evening is the proper time for thoroughly cleansing the face, since it has all day long been accumulating dirt of all sorts, the grime of toil, the dust and dessicated manure of the street, the germs floating in vitiated air, and some of the waste matter of the body which has exuded through the pores, and been retained on the surface and in the creases of the skin. To remove all this one should carefully cleanse the face every night before retiring.

BREATHING.—A scant chest measurement, with little increase during the expansion of breathing, indicates lung weakness or a susceptibility to such weakness. The lungs are suspended within the boney cage made by the ribs and spinal column, and are very much like a pair of bellows: when the chest expands by muscular effort, whether conscious or unconscious on the part of the individual, the lungs fill with air, which merely rushes in to fill the vacuum. The more the chest expands the more air will enter the lungs, there to provide the



Careless and incorrect attitude, without the natural arch of the back. When the lower back is straight or nearly so, as here, the chest and head slump forward and downward, the abdomen sags and protrudes, and the entire bearing lacks vigor.

life-giving oxygen to the blood. It is absolutely impossible to oxygenate the blood fully and to send it bounding through the arteries to supply vitality to every organ and member of the body when one breathes shallowly. Without deep breathing one is anemic, spiritless, lacking magnetism, and that "color of personality" which is the central quality of personal charm and beauty.



Natural and correct carriage of the body, with the head erect, chest well up, and consequently, with the abdomen naturally and easily retained. Note the normal arch of the back. Position is not forced or strained.

CARRIAGE.—But the best method for preserving the beneficial effect of this physical culture and for securing permanent mental and physical relief by means of correct breathing and the other natural functioning of the body organism, is to form the habit of holding in the mind, throughout the day, the ideals that have been set forth, and acting upon them as occasion permits. Thus when you stand or sit, let it be in balance—naturally straight at front and back and without an inclining position either to one side or the other. If you bend let it be at the hips. Avoid a slouching position; keep the shoulders back and the head well up.

The eyes of men brighten with appreciation when they see a woman instinctively well poised and with a good carriage. They themselves feel they are in the presence of a superior woman and so conduct themselves accordingly. Their mental attitude changes to greater affability, their wits sharpen, their minds and hearts take on a spirit of grace and chivalry and they feel that they want to be better men, more gentle, more kindly, more courteous—to be real gentlemen in every sense of the word.

Your own self-respect and approbation are an even greater

reward for diligence in exercise. A perfect bodily development brings with it a realization of the best delights of life. With every part of you tingling with vitality, you taste sweets unknown to you before you gave your body a chance to develop as Nature intended it to. Those emotions which are characteristic of girlhood and young womanhood reach perfection only in complete health. They are yours for the seeking.

EARS, PROJECTING.

—If these are taken early in life, they may be benefited to a large extent. Every night the ears should be bound close to the head, by means of a bandage, passing entirely around the latter. The ears should not be pressed outward by the hat or cap. If a cap is used in winter-time, the ears should be enclosed underneath it. This is the only local treatment which is of any avail; constitutional methods of treatment may be adopted; but the constant compression of the ears to the sides of the head is the only plan which can be followed with any hope of benefiting this condition.

EXERCISE.—A fear prevails among women that exercise will give them the hard, sinewy development seen in athletic men. Such a result is impossible in women for the physiological



The appearance of outstanding ears may be improved by persistently wearing a bandage close to the head in this manner every night during sleep.

reason that the blood of a woman contains more fatty globules than that of a man, and therefore more fatty tissue is deposited under her skin than under his by an increased circulation, such as comes from exercise, though excess of fat is carried away. Thus a man may grow lean, and a woman plump as a result of identical physical training. No matter how muscular a woman may become by exercise, this fatty tissue always fills in the hollows of the frame. The muscles themselves become more symmetrical by proper training, and, while they grow firm, do not become hard. Furthermore, the increased circulation makes the skin soft in texture and clear in appearance, its perfect health enabling it to eliminate through the pores all waste matter. A bad skin is always indicative of imperfect elimination of this sort. Very often a woman's face will be sallow in color, and marred by pimples and blotches, while the skin of the rest of the body is white and clear. This is due to the fact that heavy and restrictive clothing interferes with elimination of waste elsewhere than in the face, the skin of which has therefore to do all the work, and, this strain combining with impaired circulation, it does it incompletely, and is poisoned by the waste matter which it retains.

An unhampered waist is essential to a good circulation. For motives of health and comfort alone no girl would wear a corset. But she wishes to have a trim feminine figure, for which she thinks it necessary to be, as the Scotch phrase in "Annie Laurie" has it, "jimp around the middle," and, to gain this effect, draws in her body at the waist by mechanical means. The proper way to accomplish this end, however, is by regular exercises tending to develop the waist' and hips, and, in the case of obesity, to reduce the fat of the abdomen. Exercises for all of these various purposes will be found in *Physical Training for Women*, Chapter VII, which should be closely studied.

EYES, CARE OF.—Just as the shaft is only the apparent hair, while the root is the real hair, so the real eye is to be found in the optic nervous system, not in the eyeball, which is merely the

terminus of the system, the end of a nerve, a marvelous mechanism, it is true, but subordinate to the vital organism behind it. The mechanical rather than organic character of the eyeball is demonstrated by the fact that, if impaired, or if parts of it, even, are destroyed, the loss can be repaired by the aid or substitution of artificial contrivances of glass, while, if the optic nerve is impaired, the only remedy possible is the restoration of its powers, and if it is destroyed, no substitute for it can be found. Consequently proper treatment of the eye should include the whole optic system, instead of the eyeball alone, as is commonly the case, and as treatment for nervous disorders largely depends on that which influences the whole body, the hygiene of the eye is therefore principally constitutional.

Genius, that is, supreme endowment with specific qualities of mind, is almost always indicated by the eyes. We read of "the penetrating stab of the eyes of Bonaparte, the mystic, dreaming eyes of Swendenborg," and, from our own experience, are convinced that the writer is a true historian, describing actual impressions made upon contemporaries, and not using a poet's license in inventing appropriate qualities for these features.

The eyes are capable of expressing not only general emotions and broad traits of character, but also ideas and specific thoughts. Not only figuratively, but literally some people "talk with their eyes." In this accomplishment the Orientals are especially proficient. Secret information of a proposed conspiracy has been communicated from one native to another, by the eyes alone.

Wherein this wonderful power of expression consists, writers have never been able to determine. Like beauty in its various manifestations, by its very elusive mystery it charms as it bewilders us. Many theories of the beautiful have been advanced by philosophers at various times, but in no instance have they been able adequately to explain *how* or *why* certain combinations of colors and of form should excite pleasant rather than unpleasant sensations. And this is specially true

of the eyes. The most delicate instruments might not be able to establish a perceptible difference in color, form or size of two pairs of eyes, and still one pair might be considered beautiful and the other homely.

But these are matters of psychology, physiognomy, and theoretical æsthetics into which we have no business to enter here. Study of these subjects will lead to no practical conclusions as to the cultivation of beauty and expressiveness in the eyes, save it be the general negative one that these qualities can be obtained only by cultivation of the mind and character which they express.

Let us, therefore, revert to the simpler, surer, and more practical ground of hygiene, wherein will be found many suggestions of substantial value as to the cultivation of beautiful eyes.

First of all, the eye to be beautiful must be strong, that is, free from all defects, such as myopia, obliquity, and astigmatism. Second, the eye must be clear, that is, free from the discolorations of impure blood. A perfect digestion, a healthy and energetic circulation of the blood, a delicate nervous poise, are all physical prerequisites to beautiful eyes. Form, color and size, however important in themselves, avail nothing without the lustre and brilliancy and expression imparted by general physical tone, and, though the shape and color of the eyes can never be changed, they can be greatly improved in strength and appearance by a rational system of constitutional and hygienic treatment, which, by toning up the nervous system, improves the real eye, the optic nerve.

Unfortunately modern scientists are apt to be opportunists instead of radical reformers. They prefer to patch up rather than to rebuild. Thus oculists have been more impressed with the wonderful mechanism of the eyeball than with the less striking, but far more important physiology of the optic nerve, and have concentrated their attention on supplying defects by artificial means, rather than curing them by natural means. Spectacles have been rightly called "eye-crutches." From the number of people wearing them the present generation ap-

pears a race of eye-cripples. They are found on almost every old person, on every other person of middle age, on many young men and women and on a noticeable number of children. Were as many people to be seen hobbling about on wooden crutches and canes we should exclaim at the terrible condition, look around for the cause, and set at once to remedying it. Yet there is no excuse for more people to wear spectacles than to use crutches. Proper attention to general health and judicious care of the eyes in the early stages of the trouble would have saved nine out of every ten wearers of spectacles their present necessity of leaning on these crutches.

There is no better index of general health than the eyes. They sparkle with vitality when their owner is well; they lose their lustre when he is in bad health. If the functions of the various organs are properly performed blood is furnished to the eyes in all its purity. The eyes nourished with pure rich blood are brilliant, healthy and strong. But if the defecating organs are slow and torpid in their functions, a sluggish circulation of impure blood follows, and the eyes, along with the other bodily organs, grow weak and dull. Imperfect digestion and general nervous debility affect the power of the eyes for usefulness as well as their appearance. So true is this, that one may safely assert that nearly every case of defective vision not caused by intemperate use is made possible by the general debility of the whole system rather than the local causes usually blamed. The futility of applying local remedies thus becomes manifest. They fail to remove the cause of the trouble. To the true oculist the eyes should be, as in fact they are, the thermometer of health; and the first step in the diagnosis of every case submitted for treatment should be a careful investigation of the patient's general physical condition. If, upon examination, it be found that he is suffering from pronounced general debility, the very first efforts should be directed toward the correction of that and toward the establishment of a healthy nervous tone through a simple, nutritious and abstemious diet, fresh air and exercise, together with the local and other treatment advised.



Pulling the eyelashes stimulates their growth.

Weak Eyes and Defective Eyesight.—

Leaving out physical weakness, one of the chief causes of weak eyes is overwork. To persist in fine needlework when the eyes have registered a protest; to read fine print, or coarse print on inferior paper; to strain the eyes by attempting to read in a

dim light, is but to court disaster for the visual powers. Strained eyes, like sprained ankles cannot be cured in a day, nor by the application of local remedial agents alone. Time, rest, general nervous relaxation, assisted by physical culture, dietetic and general constitutional treatment can alone effect a cure.

Instead of taking this rest and constitutional treatment a woman with overworked eyes generally will resort to an oculist, who almost invariably prescribes glasses, saying nothing about the natural remedies. The spectacles afford her instant and grateful relief from the strain and she goes back to her work; thus that which was intended as a blessing becomes a curse, and she goes through life a victim of the spectacle habit, exchanging from time to time her old glasses for new ones with higher power, as her eyes fail more and more under the unnatural strain put upon them. There is no organ of the body to which rest is so essential as the eye, and the sign of the need of this is weariness, and even the "blessed angel of Pain." These danger signals are taken down by spectacles, which thereby become an obstacle to the attainment of permanently sound vision.

Even where it is perfectly proper to use spectacles for reading, these should be removed at other times, since this will cause an acceleration of blood to the optical nervous sys-

tem, due to Nature's attempt to cure a declared bodily defect, whereas the continual wearing of the spectacles, by disguising the need, would diminish the flow.

Even though glasses did not impede the restoration of the eyes to health, there would be sufficient argument against women wearing them in their impairing the beauty of the face. Imagine the love alluring eyes of Venus looking through spectacles, or the nose of Cleopatra, upon the length of which, it is said, depended the destiny of the world, pinched by a pair of pince-nez! And yet there are women with a perverted sense of beauty who imagine that the wearing of glasses or the use of a lorgnette imparts an air of distinction! As well might a lame woman be proud of her crutch. But stay! Did not all the English ladies of fashion once imitate Queen Alexandra's limp?

There are unquestionably certain defects of vision that can be remedied by capable and efficient oculists. It need hardly be said that only the most capable and absolutely dependable practitioners should be retained in this connection, for one's eyesight is precious beyond all monetary value. There is an unfortunate tendency on the part of modern men and women to take up the use of spectacles without first attempting to improve the eyesight through rest and by constitutional measures. Remember that the eyes will very often respond readily to local and constitutional treatment, and do not depend too greatly on spectacles, and utterly neglect health-building measures for the relief of their troubles.

If the eyes have been abused for years and years, one can hardly expect the trouble to be corrected and the eyes made strong in a few days or even a few months. It is a slow process, but if, as has been repeatedly emphasized, the methods herein suggested be earnestly and carefully followed, restoration to a condition of normal health must be only a matter of time.

Supplementary to the constitutional treatment of rational diet and exercise, specific massage of the eyes will be found beneficial to them. For this purpose exhaust cups have been

devised, which, placed over the eyes, by suction draw the vitalizing blood in increased quantity to the adjacent parts. But the use of these cups is sometimes disagreeable, and there is always danger of excessive suction. Accordingly it is wisest to employ eye-exercises and eye-massage with the fingers, which effect the desired increase of circulation with no disagreeable sensations and under better control.

The exercise of the eyes, by rolling the eyeballs in various directions and focussing the vision on distant objects, draws the blood to the eye-muscles employed, and even to the contractible parts of the eyeball, and so tends to vitalize these, and stimulate them in their functions. On pages 2322 and 2323 of Volume IV of this work are photographs illustrating these eye exercises.

They should be followed by eye-massage, which is also illustrated. These exercises and massages should be performed once a day, night or morning, each from five to ten times. Very great care should be taken not to overdo them the first few times. It might be well at first to take each exercise only two or three times each day for the first few days.

After massage, the eyeballs should be carefully bathed in



Massaging the eye with the finger tips. This should be done gently, but firmly and persistently.

moderately cold salt water, either by using an eye-cup, or by immersing the face in a bowl. In the latter method, continue to open and close the eyes as long as the breath can be held. (See illustrations on pp. 2045 and 2046, Volume IV.) Repeat at least three times.

Bloodshot Eyes.
See *Watery Eyes.*

Dark Rings Under Eyes. This is generally a sign of depleted vitality or exhaustion. Sexual excess is a frequent contributory cause; and, very often, secret sexual abuses are discovered in cases of this character. Again, this condition may be due to lack of sleep and proper rest; and if this is the case, the curative measures are clearly indicated. Worry and other depressing mental disturbances and emotions will help to create dark rings under the eyes—and, needless to say, such states must be removed before any permanent cure can be expected.

If the dark lines are not due either to sexual excesses or to fatigue or sleeplessness, they can only be helped by general constitutional measures. A general vitality-building regimen, in which an abundance of exercise, fresh air and a milk diet predominate, will be found helpful. See that the skin is active and that constipation is not present.

EYES, DISEASES OF.—See *Eye, Diseases of*, and *Sight, Disturbances of*, in Volume IV.

Drooping Eyelids. This is more natural with some types of individuals than with others; it is said to accompany a naturally sensuous type of individual; but the factors which cause the one condition may also cause the other. Persons with drooping eyelids should take good care of their kidneys, since this is often a sign of kidney trouble. Benzoin or the use of some mild astringent to contract the skin, may prove useful. Care should be exercised in applying these lotions, however, not to allow any of the mixture to enter the eyes. Alternate hot and cold compresses will be found useful—always ending with the cold. Care of the general bodily health is essential. Avoid rich and greasy dishes of all kinds.

Puffiness Under Eyes. This is generally a symptom of kidney disease—more or less serious. You may not notice it for years; but it is an indication, none the less. Of course, if it is only temporary, it may mean simply that you are tired and sleepy—for which condition rest and sleep are all that are required. But if chronic, you should pay particular attention to your general health. Avoid meat as you would a poison—

for some weeks at least. Avoid proteid foods of all kinds for some days. In fact, a short fast would benefit you greatly; or a fruit diet for three or four weeks would have the same effect. Drink plentifully of water. I should advise rest in bed for two or three days, if possible; this to be followed by a period of fairly active exercise. Turkish baths would prove especially valuable, as would hot and cold spinal applications. Great care must be taken not to overeat. Avoid all alcohol, tea and coffee. It is especially important to remember this.

Red and Upturned Eyelids. This is a peculiar condition, sometimes found in the case of people who have red hair. It is rarely found in any other cases. But little can be done to alter the condition. Cold packs, hot and cold eye baths, etc., may be tried, always ending up with the cold pack. Pulling the eyelids and eyelashes with the fingers in a downward direction, may help. If this condition is due to any inflammation, it may certainly be relieved by these measures, coupled with vigorous constitutional treatment.

Thin Eyelids. If your eyelids are abnormally thin, it is improbable that you will be enabled to thicken them materially. At the same time, massage, hot and cold local applications, frequent eye baths, pinching and pulling the skin of the eyelid, etc., may bring about good results in a number of cases. A milk diet might be tried for a while, to build up the flesh and tissues generally. "Blinking" the eyes a number of times a day may be found helpful. Be careful, however, that this does not leave you with a nervous habit of twitching the eyes; if you find that it is doing so, discontinue the exercise at once.

Watery Eyes. Watery eyes generally denote a weakened and devitalized condition of the eyes and general nervous system, and should be treated locally and constitutionally. A general health and vitality-building regimen is essential, and care must be taken not to overstrain the eyes in any direction. *Bloodshot Eyes* arise from like causes, and should be similarly treated. In addition to the general treatment, hot and cold eye baths, cold compresses, massage of the adjacent parts, etc., may be tried, generally with noted benefit.

FACE.—See *Skin*.

FEET, CARE OF.—Just as the causes of a tree losing the glory of its foliage may be traced to the cramped condition of its roots, so the loss of beauty to a woman's face is often the result of the ill treatment of a remote part of the body. Many a wrinkle about the eyes is due to tortured, unhealthy feet.

The foot is a marvel of delicately adjusted mechanism scarcely less wonderful than the hand, and yet it is frightfully abused. How few adults there are who have not a permanent affliction of the foot in one form or another, from corns to general tenderness and how many of these accept it as a permanent and unavoidable condition! Yet as improper footwear is the one great cause of these troubles, they can all be remedied by the use of proper shoes and stockings, or, in extreme case, by discarding footwear of all sorts and going barefoot.

Special exercises for the foot consist in stretching and moving the foot in every possible direction. There are many movements useful for strengthening the foot. The following are examples of exercises that may readily be devised for this purpose.

Sit in bed with feet extended; stretch them to limit of power toward foot of bed. After this preparation, bring right foot up to left knee, rest it and with right hand separate the toes slowly, giving the following exercises:

Pull little toe to right, following with pulling of each toe in same direction, opening spaces between and rubbing gently with fingers very slowly. Push toes to left, beginning with great toe, following with others as above, rubbing spaces between and holding toes apart. Push toes upward and then downward as far as possible without discomfort, in turn.

See descriptions and illustrations of exercises for hands and fingers on pages 1580 to 1581, Volume III, for suggestions as to the manner of manipulating the foot. Also exercises for strengthening the ankles given under Mechanical Physcultopathy on page 1593 of the same volume. Toe and heel rais-

ing are valuable movements to strengthen the ligaments of the foot.

The adage that vanity, the spoiled child of beauty, is its mother's greatest foe, is nowhere better illustrated than in the case of woman's shoes. A mistaken idea of the beautiful leads the average woman to desire the appearance of having small feet, whether or no these are in proportion to her figure. Therefore she demands a shoe that has a pointed tip, which crowds five toes in a space that has comfortable room for only one or two, and of which the heel is preposterously small and high, and pushed forward under the arch of the foot. Of course, manufacturers respond to this demand, and it is sometimes difficult for a woman to find a sensible shoe. Furthermore, the foot is so weakened by the wearing of unnatural shoes that when rational footwear is adopted which does not give support to muscles that should take care of themselves, these break down, and, through injury to the bones of the foot, a painful condition results that is sometimes permanent. Accordingly the foot should gradually be brought back by exercise to its natural condition.

French-heeled shoes, by shifting forward the center of support for the body, not alone destroy all grace of carriage, but also have a bad effect on the nervous system. The heel was intended by Nature as the body's support when at rest, and there is a general strain extending through the entire system when this intention is perverted. In walking, the weight is naturally borne alternately by the heel and the ball and toes and the disturbance of this relation by the shape of modern woman's footwear produces an unsymmetrical development of the leg muscles. Indeed, a woman who hobbles along on French heels might as well have wooden legs, so unused are the muscles of the calf, the function of which is to lift the heel while the foot is bending at the toes.

The deformities and troubles of the feet are usually of long standing, having their origin in the wearing when young of improper shoes, which moulded the soft and pliable bones and ligaments into bad shapes and encouraged the supporting mus-

cles to neglect their duty. Accordingly to remedy these evil conditions is no short and easy task.

The first step in curing the foot of the "evils of civilization" is to give it the proper kind of shoes.

Going barefoot is the ideal condition for the foot, and the nearer that footwear approaches this condition, the better it is not only for the foot, but for the calf and upper leg, and, indeed, the whole body. The moccasin of the Indian and the ancient sandal are therefore the best models for shoes. Each affords the protection desired, without impairing in the slightest the muscular development produced by going barefoot. The sandal in particular retains the hygienic advantages enjoyed by the natural man, since it freely admits the air. It is exceedingly fortunate for children that sandals are permitted them by fashion, since it has taken away from them the time-honored American right of going without any shoes at all. Undoubtedly, if young women had prettier feet, the practice of sandal-wearing would soon extend to them also. It is only the athletic girl, who has come to recognize the beauty of health and utility in the foot, that fears not to show its natural shape. By the wearing of moccasin-like shoes at the games of tennis and basket-ball she is paving the way for wearing similar shoes on all occasions. Then the feminine foot will at last be restored to its pristine health and beauty.

When ordinary shoes are worn these should conform as closely as possible to the style for men, differing only in lighter weight and finer finish. The sole should be broad enough to support the sole of the foot in every part, the heel low and broad, and the leather flexible enough to permit play of the muscles, and with its natural porosity unimpaired, in order to permit the foot some degree of "breathing."

Patent leather or waterproof shoes are to be avoided as most unhealthy since the leather has been treated with special design to make them non-porous. Wearing such shoes causes the feet to become overheated, stewing in their own foul perspiration.

Stockings, like shoes, should be well fitting. If too large, they wrinkle and abrade the skin, and if too tight they prevent play of the muscles, causing discomfort, and they lead to irritation of the tender skin between the toes by cramping these together. They should have as few seams as possible. White stockings, or those with white feet at least, are to be preferred to colored, especially for children, whose legs are apt to be scratched in their play, and are therefore in danger of being affected by the dye in their hosiery.

Cotton stockings are better than those of lisle thread, since the yarn in them "gives" more readily, and so permits freer play of the muscles. When the feet are properly attended to, cotton stockings can be worn with comfort all the year round.

Negatively as well as positively vanity is responsible for the existence of the many ills and deformities which the feminine foot endures. Were the feet exposed to view, as the hands and face are, no woman would tolerate for a moment the ill-shapen, unhealthy, and even unclean toenails, and the corns and callosities which are so prevalent, and so patiently accepted as a normal condition. This indicates a low state of moral health among the sex, such as existed among the Pharisees of old who cleaned the outside only of the platter.

How much holier is it, therefore, to make clean and wholesome the temple of our bodies in every secret corner!

General Care of Healthy Feet. Since the heavier clothing of the feet, worn even when the rest of the body is in undress, prevents them receiving any benefit of sunlight and free air, they should be bathed frequently, certainly every night or morning. This will be found a most soothing and restful practice. Bathing the feet before retiring is the best means of insuring a good night's sleep, and bathing them at the beginning of the labors of the day produces a glow which acts as a tonic for the entire body.

The whole art of health has been summed up as "keeping

the feet warm and the bowels open," and when the first condition has been secured by an increase of circulation it may be said to imply and include the second condition. Accordingly, though warm water may be first used for thoroughly cleansing the feet, they should afterward be plunged into cold water, and then vigorously rubbed with a coarse towel.

Scrubbing with a flesh brush is also helpful in inducing increase of circulation, and removing the dead cuticle that tends to form callosities.

Aching, Feet. If the feet ache from over-exercise, they should be soaked in warm water, in which a little salt has been placed; then dipped in cold water for three or four seconds; then rapidly dried. They may be rubbed with linseed oil, and massaged with the fingers for a few minutes before retiring.

Very much the same measures may be applied if the feet ache without excessive exercise. In that case, however, it is a sure sign that you are upon your feet too much of the time, and you should sit, or preferably lie down, a considerable part of each day, until your feet gain their vigor and elasticity. Cold bathing for the feet will be especially valuable in your case; and a system of exercising them by moving them about in all directions. Rubbing the feet vigorously with friction brushes or a rough towel, thereby increasing the circulation of blood to the parts, will harden them. Bathing the feet in cold, salted water can also be recommended. Keep up the general health, and, as the body is toned up, the "ache" will gradually disappear.

Ankles, Making Smaller. If there is no superfluous tissue about the ankles, and their size is merely the result of the structure of the bones, ligaments and tendons, then it is practically impossible to reduce their measurements. But if, as often happens, the ankles are heavy through a deposit of adipose tissue, then all exercises involving much activity of these parts are recommended, until you have acquired a clean, muscular outline of the entire lower leg without any surplus of fat. Hill-climbing, running, tennis and

similar activities, in addition to special home exercises for the ankles and calves, will do the work. Feet and ankles are nearly always perfectly proportioned to the build of the individual, and if the ankles seem large through their bone structure, then the very same training intended to develop the muscles of the lower leg and make it shapely, will give the ankles the symmetry and beauty that are desired.

Bunions particularly mar the beauty and symmetry of the foot. They are caused by pressure on the joints of the great and little toe. If not attended to they cause, besides ugly disfigurement, great pain. The real cure is a shoe that is broad enough to avoid all pressure, and relief is afforded by wrapping the foot in a wet towel, allowing it to remain all night. The beauty of the foot depends upon the development of the muscles. Properly, two sets of muscles are brought into play during walking, those which raise the heel and those which flex the toes. The compression of the shoe renders any movement on the part of the toes almost impossible, so that the work of locomotion is almost wholly performed by the muscles which act at the ankle joint. Thus, through disuse, the muscles at the toes largely lose their power of movement—movement which originally was of wide range. This fact is well borne out in the case of persons whose hands through one cause or another having become useless have partially succeeded in training the feet to take their place. Furthermore, if it be considered that certain muscles maintain the large arch of the foot the importance of keeping these muscles strong will be evident. The arch of the foot, besides preserving adjacent parts from jar due to impact in walking, have underlying them nerves and blood-vessels and other tissues which are injured when the arch is broken down and the weight of the body presses upon them. The broken down arch affects one's gait, making it shuffling and ungainly. On the other hand, the arch that is high and well marked besides lending grace and shapeliness to the foot gives elasticity and firmness to the step. Exercises that bring the muscles of the foot into use should be indulged in to strengthen these parts.

Regarding bunions, Dr. Trall, in his "Hydropathic Encyclopædia," Vol. II, has this to say:

"This affliction, though generally regarded as a kind of corn, is really an inflammation and swelling of the bursa mucosa (this is a membrane lining the joint and secreting a lubricating fluid) at the inside of the ball of the great toe. It often produces a distortion of the metatarsal joint of the great toe, and is produced by the same causes as corns. The treatment is, warm foot baths when the part is very tender and irritable; at other times, frequent cold baths; and when a horny substance resembling a corn appears externally, the application of caustic. I have known bad corns and bunions cease to be troublesome after the patient had been a few months under hydropathic treatment for other complaints."

Sore insteps, big joints and corns, when no positive means are adopted for their cure or removal, may often be made tolerably comfortable by having the shoe carefully adapted to fit them.

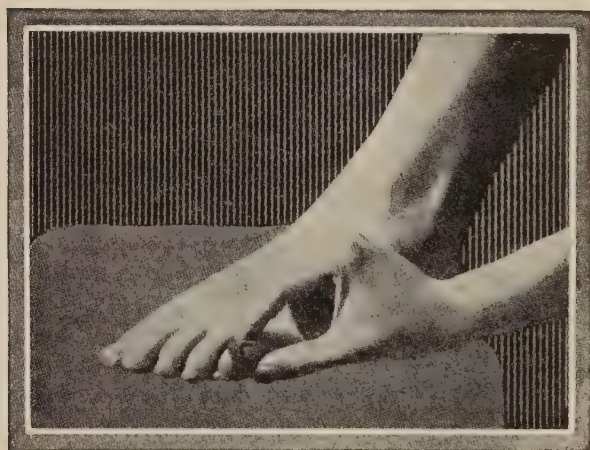
Callosities. A most effective treatment for feet that are calloused is to soak them every night for about ten minutes in hot, very soapy water; after which they should be dried carefully, and the calloused spots rubbed with a piece of pumice stone. The kind to be used is the stone in its rough condition, not the prepared kind. When pumice stone is used one should always apply a little grease to the rubbed

parts. During the day vaseline should be applied to the spots to prevent them from hardening, and if soft insoles are worn, it will be of great advantage. Lemon juice is said by those who have used it to



Callous spots upon the foot may be removed by gently rubbing them with pumice stone in this manner.

be effective in affording relief for this annoyance. After the bath the parts affected should be rubbed with a slice of lemon. This will soften the calluses so that friction with a coarse towel will, if they be of recent development, rub them away. If they are very hard, however, it may be necessary to bind slices of lemon on the parts over night. All pressure on the spots should be removed. The most common seat of a callosity is the ball of the foot. The fallen metatarsal arch, which is the cause of this pressure, should be corrected at once. For the causes and proper treatment of this pedal ailment, see *Flatfoot*, page 2059,



A small ring of felt applied in this manner will often relieve a corn due to abrasion of the foot by ill-fitting shoes.

"Sweaty" Feet. If too much food is ingested and the work of expulsion is not distributed among the depuratory organs as it should be, the system takes advantage of the favorable circumstance of overheating by socks and shoes to discharge as much waste as possible through the feet. Rational treatment calls for reformation in eating, drinking, exercising, clothing, and bathing habits, not in some medicated liquid that will prevent perspiring of the feet by paralyzing their sweat glands.

Not only is constitutional treatment, such as outlined under *Catarrh*, page 1926, Volume IV, indispensable in these cases, but changing the socks daily, washing the feet with pure soap

Volume IV.

Chilblains. See page 1934, Volume IV.

Cold Feet. See *Circulation, Defective*, page 1944, Volume IV.

Corns. See page 1980, in Volume IV.

Flatfoot. See page 2059, Volume IV.

and warm water followed by cold three or four times per week, bathing the feet in cold water night and morning, wearing thin hosiery and low shoes, preferably of porous kid leather, and going barefooted frequently, are also urgently required. The bowels should be kept active by eating less of the heavier foods and more of the fresh fruits and vegetables, drinking plenty of water, and taking considerable exercise, including a long daily walk. Increase the activity of the skin through air, water and friction.

The *nails* of the toes should be trimmed for comfort rather than appearance. They should always be left longer than the toes which they are intended to protect, and should not be filed down too thin. The cutting will be greatly facilitated by first bathing the foot in warm, soapy water. The toes should be carefully scrubbed with the nailbrush to remove every particle of waste matter.

Nails, Ingrowing. Owing to the wearing of tight shoes, ingrowing nails are

apt to occur, especially in the case of the big toe. Where this inclination is observed, the corners of the nail should not be rounded and a pinch of absorbent cotton should be inserted under its sides by means of the orange-wood stick, to lift the edges. (See page 2205, Volume IV.)

HAIR, CARE OF.—To the enthusiast in physical culture who has observed with delight many indications of progress among women of rational ideas as to health and beauty, there is nothing so disheartening as the prevalent fashion among the sex of wearing false hair. That which should be a crown of glory to a woman is thus



Here is shown the proper method of treating ingrowing nails of the toes—they should be cut straight across, and the corners should not be rounded.

made a badge of shame, the mark of a reversion to barbarism, or rather of degenerate civilization. Unless the fashion is quickly changed, women will be obliged to continue it for reason instead of whim, as the practice of piling a mass of dead hair or jute over the natural tresses is causing these rapidly to deteriorate both in amount and in quality. Heads which but a short time ago boasted the possession of thick, lustrous growths of hair are today barely covered with a ragged, straggly fringe. Madam looks into the mirror, turns away with a sigh and—piles on more false hair, which only tends to aggravate the trouble.

A few words of explanation may be of use to women by showing them just how the constant use of false hair and pads injures the scalp. Like the rest of the body the scalp requires air, a condition which the wearing of heavy, unsanitary pads prevents. The steady weight and pressure causes the scalp to become unnaturally overheated; keeping the roots of the hair in a continual sweat-bath, causing them to veritably “rot,” just as would a plant if continually kept covered with straw or manure.

Curling the Hair. There is no natural way of making straight hair curly. The wave and curl of the hair is due to the uneven texture throughout its length, in consequence of which it curls or waves. The natural wave or curl in the hair is more evident during damp weather. There are certain fluids advised as a means of curling the hair, but their effect, if any, is temporary and at best they are useless. If the hair is cared for in accordance with the instructions given in this chapter, its appearance will be all that could reasonably be desired. By rubbing and drying the hair thoroughly with a heavy towel after washing it, a certain degree of waviness may be acquired.

Singeing the Hair. The value of this process has been much debated. Certain it is that the old idea that it closed up the ends of the hairs, which were otherwise inclined to “bleed”—that is, lose some vital energy in some way—is quite given up as a superstition. In the case of hairs whose ends are *split*, it may be useful to singe the ends, to prevent their splitting fur-

ther; but in all other cases, or in the case of healthy hair, this is not a measure to be advised.

The condition of the hair can frequently be determined by the nails. If the nails are brittle and break easily, it indicates quite clearly that the hair is in a similar condition, and will, of course, break off and fall out much more profusely than under more normal conditions. This tendency may be arrested by trimming the ends of the hairs.

The Pulling Treatment. To strengthen the hair, and bring the blood to its roots in liberal quantities, pull it slightly all over the scalp. This slightly raises the scalp from the skull, and at every point where the scalp is thus raised, the circulation is greatly accelerated, causing the hair to assimilate its food more readily.

Nothing gives the scalp the sensation of being so thoroughly and effectively awakened as does this pulling process.

The proper way to massage scalp and remove dead hairs by this pulling process, is to insert the spread fingers into the hair as you would a comb, closing them tightly together as they are passed through it. (See illustrations.) Every part of the scalp must be treated thus; this method not only



Pulling the hair to stimulate its growth.



Another method of pulling the hair.

strengthens the roots and removes all partially dead hairs, but if the "finishing touches" to the drying process after washing is done by pulling the hair evenly over the entire surface of the scalp, it gives the hair a lustre and wavy appearance that can be acquired by no other method.

Dead hairs should never be allowed to remain in the scalp; they should be plucked as soon as they can be easily removed. Under these circumstances, if they are removed another hair *always grows* from the same follicle or root sheath; but if this dead hair is allowed to remain until it falls out on its own accord, it often kills the root, and the hair never grows again. Therefore, when hair shows an inclination to come out in excessive quantities, the first duty is to pull out all that can be easily removed—for, if a spear of hair can be removed with a slight pull, life has become extinct, and the sooner it is removed the better. If the hair is dead, or partially dead, it will come out anyway in time, and why not be rid of it at the earliest moment, and give the root a chance to live and sprout a new hair?

How to Massage the Scalp. The remedy par excellence for stimulating hair growth and hair nutrition is a systematically and scientifically applied massage of the scalp. Naturally, the effect will be more marked when the treatment is applied by a well-trained masseur. With a little care, however, and a good deal of will, the method can be acquired by anybody, and one can treat himself with very good results. To accomplish this, first remove all clothing down to the waist line; this will give you a freedom of movement of your arms which you cannot obtain in any other way and which is essential for carrying out self-treatment.

In massaging with the hand, first rub the entire surface of the scalp with the ends of the fingers in order to increase the circulation generally.

Now grasp with the open hands the back of your head and pressing firmly upon the scalp, move it forth and back upon the skull about ten or fifteen times. The same exercise is repeated with the sides of the scalp and with its frontal

part. The next exercise consists in trying to grasp folds of the scalp between the thumb and index finger of each hand, and rolling it between them. This exercise, which might also be described as pinching the scalp, is practiced for about five minutes and must cover the entire scalp.

Washing the Hair and Scalp. Authorities differ as to the frequency with which hair should be washed, some advocating this should not be done more than once a month, basing their opinion on the nature of the hair, which enjoys a constant natural bath of perspiration and oil. But when it is recalled that the scalp, as a part of the skin, accumulates scaly waste, excess of deposits from the perspiratory and sebaceous glands, and ordinary dirt and dust, cleansing more frequently than once a month is necessary.

The intervals to elapse between each washing should be determined chiefly by the amount of oil supplied to the hair. If the oil is very abundant or if the scalp is exposed to much dust and dirt, the hair may require two or even three shampoos each week. Usually, however, a man's scalp can be kept in condition by shampooing it once weekly, whereas a woman's scalp needs a shampooing only once in two weeks.



Drying and airing long hair, and avoiding entangling it in doing so.

In shampooing, the scalp is first slightly wet with warm water. A small quantity of the soap solution is then applied and vigorously rubbed into the scalp. From time to time, sufficient water is added to make a good lather.

Most of us know that in washing the head the object is not so much the cleansing of the hair itself as the scalp. It is important to rub the scalp well with the finger tips, by dividing

the hair as it is done for brushing. Be careful to use only the finger tips and not the nails as they might scratch and irritate the scalp.

The lathering is followed by rinsing the scalp, first with warm, and finally with cold water.

Drying the Hair. After each shampooing the hair must be dried thoroughly with towels. A soft, absorbent towel should be used. To avoid entanglement, the hair should be taken up in strands and rubbed with the towel from the roots to the ends.

Exposure to the heat of the sun and fanning will hasten the drying process; but it injures the hair to dry it by the use of hot air. Long hair must not be braided until perfectly dry.

Special Treatment for Stimulating the Scalp. The treatment here described is of special value in baldness, excessive falling of the hair, and where the hair is very thin. When the hair is in normal health, it is hardly necessary to use it. The use of hot and cold water, alternating from one to the other, is about the strongest stimulant to the circulation of the scalp that can be used.

The hot application draws the blood toward the surface; the cold drives it back and onward in its travels to the heart, thus actually creating practically an independent and vastly accelerated circulation of the blood wherever used, and this treatment of the scalp unquestionably results in greatly stimulating the hair growth.

The best time to treat the scalp in this way is immediately after shampooing. Have the temperature of the heated water as hot as can be borne and the other as cold as possible without using ice. Hot and cold wet cloths can be applied in the same way. This latter method is better in case the hair is very thin or a bald spot is being treated. The change from hot to cold should be made from six to ten times during each treatment. Each application should be allowed to permeate the entire surface of the parts treated before changing to the other.

Soap for Shampoo. Various soaps have been recommended

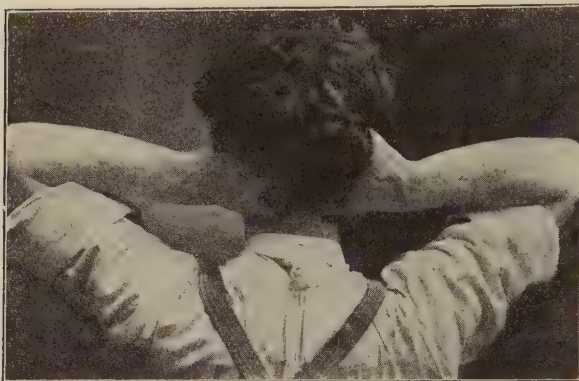
for shampooing. The chief requisites of a soap for this purpose are that it be easy of application, free from irritating and harmful ingredients, and that it form a good, stiff lather. A solution of ten per cent pure castile soap in alcohol answers all these requirements. Occasionally, when the scalp is beginning to harden, a good tar soap is preferable. On a very dry scalp a tincture of soapbark can be substituted for soap. It will remove dust and dandruff but will not dissolve oil.

Nearly all the liquid shampoos sold are too powerful, especially for frequent use; and though they do remove dirt and grease, they sometimes remove too much of the natural oil, causing the hair to become dry and brittle.

Soap containing a large percentage of alkali should not be used. The use of the egg for shampooing is very highly thought of. It has been suggested that the blonde use white of egg and the brunette the yolk. For an ordinary shampoo for either type, the part of egg to be used should be beaten up with a little water and rubbed into the scalp, which should then be thoroughly rinsed in slightly warm water to remove any of the egg that may be clinging to the hair. Where, however, a more effective shampoo is desired for cleaning purposes, a tablespoonful of a jelly made by boiling some pure castile soap shavings in water, should be beaten up into the yolk or white as the case may require, and applied as before.

Brushing and Combing. The value of brushing the hair regularly and thoroughly can hardly be emphasized too strongly. It polishes the hair, and tends very greatly to increase its lustre, but the principal value of the brush lies in the influence of its proper use upon the scalp. It should be brushed back and forth on each part until the circulation has been rapidly accelerated to the surface. As a means of accelerating the circulation of the scalp, hair brushes are of equal, if not greater, value than the brush used on other parts of the body. Furthermore, the proper use of the brush serves the very valuable purpose of ridding the scalp of dandruff and other matter which tends to accumulate.

Care should of course be used in the selection of a proper



Massaging the Scalp.

brush. The bristles should be of a proper degree of stiffness, and should be of even length; they should be of even thickness throughout the entire surface, in order to induce proper friction in every part. If

some of the bristles are longer than others, they will frequently scratch the scalp.

In the case of men the hair can be best brushed with a pair of brushes, one being held in each hand.

Great care must be exercised in brushing a woman's scalp in order to avoid unnecessary tearing of hair. Here the hair is parted successively at different places and the exposed scalp is briskly brushed. By repeating the process a sufficient number of times the entire scalp may be gone over.

Some women prefer to use a brush with stiff bristles for removing dandruff, and then use a soft one for polishing and arranging the hair.

Combing the hair is beneficial for two especially good reasons. It assists in the polishing process, and gives the hair roots the benefit of the massage and strengthening influence secured from the slight strain upon the roots.

Dandruff. The existence of dandruff does not necessarily indicate a diseased condition. A certain amount of dandruff is always present, even in the most healthy scalps. In fact, dandruff is nothing more than particles of the scarf skin, the accumulation of dirt and other minute atoms, and the refuse from the oil glands, which adhere to the scalp. The necessity for proper cleanliness, in order to avoid any possible deleterious effects from this constant accumulation, is quite apparent.

Where dandruff is allowed to accumulate in excessive

quantities it is liable to produce a number of very irritating diseases. Eczema is frequently produced largely by causes of this nature. When dandruff appears in large flakes, or is excessive in quantity, immediate efforts must be made to bring about a normal condition.

Many believe that washing the scalp creates dandruff. But this



Persistent massage of the scalp and frequent brushing of the hair are essential to the maintenance of the beauty of woman's crowning glory.

false conclusion is very easy to disprove. Where the quantity of dandruff falling from the scalp apparently increases when the scalp has been cleansed, it simply indicates that the cleansing process has released the dandruff from the scalp, and consequently it appears in greater quantities.

Regular shampooing of the scalp, massage and brushing will prevent the excessive accumulation of dandruff.

Gray Hair, Premature—How to Remedy. The hair obtains its color from the coloring glands situated nearer the surface than the hair root. When these glands are impaired or destroyed by old age or any other cause, the hair naturally loses its color.

Hair will frequently turn gray, even in early youth, from nervous shocks and other abnormal influences. A youthful face accompanied by almost white hair can be occasionally seen. The fact that the hair is turning gray does not in every instance indicate that it is losing vigor. The hair roots may be as capable of nourishing the hair as before.

The hair usually begins first to turn gray over the temples near the ears, then gradually creeps to other parts of the head. Frequently when the hair begins to whiten it begins to fall in greater quantities, and especial care is needed under these circumstances to avoid permanent loss. Where hair has turned gray from general physical causes—decline in health, nervous troubles, and the like—it can in some few cases be brought back to its original color by the means necessary in the building up of the general health and by careful local treatment.

A preparation consisting of yolk of an egg with a few drops of chloroform worked to the consistency of paste is recommended for lack of color of the hair. This preparation should be applied to the roots of the hair, and after remaining for a half hour or more should be carefully washed off with some warm water.

Even people with an abundance of gray hairs need not despair. According to Sanford Bennet, the "man who grew young at seventy," a systematic massage of the thyroid gland has stimulated the growth of patches and streaks of black hair



Smoothing the eyebrow with the finger tips improves its appearance and symmetry. With this may go a gentle pulling of the eyelashes to stimulate their growth, and improve the eyebrow.

over the head. This may sound strange to the average layman, but to the professional man who knows what a powerful influence the internal secretions of the thyroid gland have upon the functions of the system, it seems not at all physiologically improbable that the vital influences of the gland may extend even to the nutrition of the deepest layers of the hair roots where the pigment cells of the hair originate. To stimulate the ac-

tion of the thyroid gland the central portion of the neck below the "Adam's apple" should be stroked with a side-to-side and up-and-down motion for about two minutes daily. People suffering from palpitations of the heart or exophthalmic goiter should avoid this exercise.

Dry and Brittle Hair, Treatment for. At times there is an insufficient supply of oil. Often this is due to the collection of dust upon the scalp. The dust particles clog up the pores and prevent escape of sebum, which accumulates within the gland and distends it; the gland becomes inactive and if the condition is not relieved, it atrophies or dies. The pressure of the distended gland upon the hair root interferes with its growth and nutrition. On the other hand, the lack of oil manifests itself in the dry appearance of the hair. Such hair loses its luster and waviness, becomes brittle and begins to split or break.

Cocoonut oil, carefully applied once daily with the finger tips to the scalp, is recommended for hair which is abnormally dry. Other local treatment in the way of vigorous brushing twice daily, massage, general care of the hair will remedy the condition. When the hair is very dry it should not be washed more than twice monthly. After every shampoo cocoonut oil or sweet almond oil should be rubbed into the scalp.

Remember, it is the scalp, and not the hair, which is to be treated with oil. This can be best accomplished by dipping the finger tips in oil



To have attractive eyebrows and lashes they must be cared for regularly. Brushing the eyebrows will promote circulation, and smooth them. Use a small brush and do this daily.

and rubbing the scalp gently, first parting the hair so that the scalp can be reached, and so avoiding the unsightly greasy appearance not infrequently observed in the hair of some persons. Where the dryness has progressed to the stage of brittleness and the hair splits and breaks in places, it is further necessary to clip the hair short and to keep it short for months.

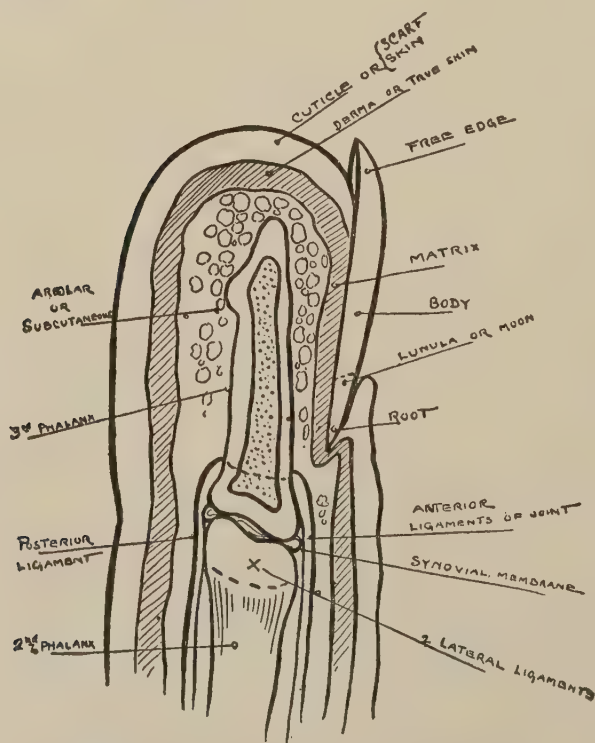
In the case of dry and brittle hair, brushing, massaging and other treatment should be at first gently applied; as the growth and quality of the hair improves, the treatment may be made more vigorous. Of course, as in all hair and scalp troubles, the general health should be given attention.

Dull hair is due to lack of natural oil. The same treatment advised for dry hair to be followed.

Eyebrows and Eyelashes. The fact that eyebrows and eyelashes can be strengthened and made to grow thicker and longer is not generally known. Proper care will greatly im-

prove them in every instance, and the possibility of losing them under such circumstances is hardly worth considering.

Once each day, or at least two or three times a week, all the hair of the eyebrows and eyelashes should be slightly pulled several times, thereby removing all partially or entirely dead hairs, enabling the new



Cross-section of nail and finger tip, enlarged.

hairs to appear, which in nearly every case are stronger than those removed.

Great care should be used to avoid pulling the eyelashes too strongly, at least during first attempts. Do not be in the least alarmed if a great many hairs are removed in the first few times this process is practiced, for a new hair will grow for every one removed. The hairs that remain under these circumstances will also grow stronger under the influence of this method and should therefore grow longer, giving both the eyelashes and the eyebrows a more pleasing appearance.

In pulling the eyelashes, a number should be caught, say of the upper lid, between the finger and thumb, pressing slightly on the hairs as they are pulled outward. The same process can be used for the lower lashes and the eyebrows. Kneading and massage are also of benefit.

Applications of any kind are of no value in improving and strengthening the hair of these parts. The natural processes here advised are the only means that can be relied upon to bring about satisfactory results. The most common troubles are scanty and ill-shaped eyebrows. These conditions may be greatly improved by the use of either vaseline, almond oil, or lanolin, together with a small brush. The oil will promote their growth. And if the brows are light in color, the oil will help to darken them and make them more conspicuous and the brush will smooth them and train them in the right direction. Where the brows are coarse and unruly it has also been found beneficial to brush them as they should lie with just a touch of a mucilage made of quince seeds and rose water. It should be applied at night, and in the morning washed off with a little warm water, care being taken not to rub the hairs the wrong way. This roughens them and causes them to break. It should be remembered when treating the eyebrows to observe the greatest care and to use only small quantities of any preparation.

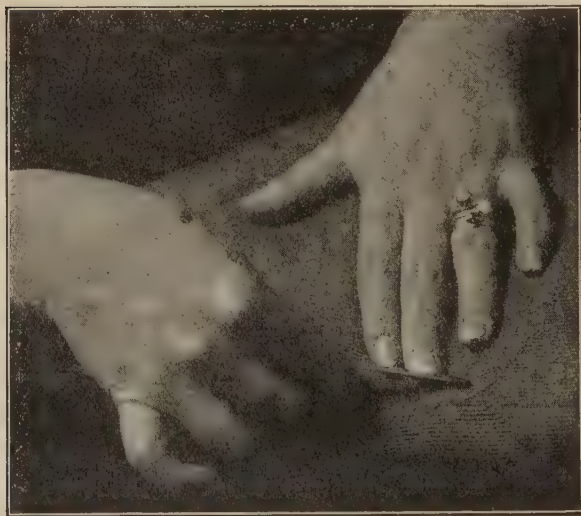
Curling. Women are warned against the evil practice of curling and crimping the hair. Because the hair shaft is not supplied with nerves of sensation does not imply that it can be

tortured with impunity. Roasting the hair is just as bad for it as scorching the finger nails (to which it is similar in nature) would be for them.

Bleaching the hair with strong caustics is even more destructive of its health and vitality than the use of the hot curling iron. It is as absurd to think such a treatment harmless as it would be to attempt to remove the color from the lips and cheeks and expect health to remain.

Dyeing. Hair dyes of all kinds should be avoided. The natural color of the human hair, regardless of what it may be, if properly cared for, cleansed and polished daily, is far superior in color to what it can be made to assume by the application of any dye. All these dyes will injure the hair.

HANDS, CARE OF.—Next to the face the hand is the most expressive part of the body, and so requires especial attention to make it a desirable exponent of character. Well-kept hands have in all civilizations been regarded as the crowning evidence of culture. "Polished to the finger tips" is a well-known phrase of the Latin poet Horace; it is certainly most eloquent.



The nail file should be used in the manner here illustrated. The nail should be filed from the inner side, with firm pressure, and the file should not be moved too rapidly. A little practice will enable even the novice to use the nail file with gratifying results. The use of a knife or scissors in trimming the nails is not to be recommended, as the file is far more satisfactory.

Unfortunately too much attention to nail polishing and too little to the development of the muscular structure of the hand has been paid of late by professional beauty culturists. The modern manicurist, a term derived from the Latin words *manus*, hand, and *cura*, care, utterly

neglects the hand itself in her work. As William A. Woodbury, the dermatologist, says: "She ought to take down her sign 'Manicurist,' and hang up instead one labeled 'Nails Shined Inside.'"

Physiologically the hand is a marvelous mechanism in its complex adjustment of anatomical forms to special purposes. Bones, muscles, ligaments, nerves, arteries and veins are combined most delicately and ingeniously to form the greatest tool in creation. And, as it is the mark of a good workman to take care of his tools, it is the index of a sensible man or woman to keep the hands in proper condition, since we are all, in one form or another, manual, that is, "hand-using" laborers.

The first duty in caring for these valuable tools is to keep them clean, that is, really rather than apparently so. Gloves are a frequent substitute for cleanliness, and when so used, form its worst foe. As a rule, the hygienically important part of gloves, the inside, is rarely cleaned, and so the wearing of them nullifies the effect of washing the hands by keeping these in constant contact with dirt, and that of the worst form—the effluvium of the body.

Chapped Hands. Although worn to prevent chapping, gloves are in fact a chief cause of this disagreeable and unsightly condition. Chapped hands are simply soiled hands, hands where the dirt has worked into the skin and set up an irritation. They are best treated with a mixture of cornmeal, shaved castile soap, and warm water, with a little olive oil or vaseline rubbed in afterwards. In obstinate cases a little lemon or lime juice may be used with the oil.

If olive oil is rubbed into the hands when these are about to be submitted to conditions which may produce chapping, it will do much to prevent it.

Roughened Hands. In the cases of lean hands and hard, coarse hands in which the skin is lacking in oily secretion, the application of olive oil from time to time is advisable. It may then be properly denominated by that much abused term "skin food," since it supplies lacking element to the epidermis. Otherwise it is unnecessary and since dirt is defined as "matter

out of place," it will only prove an aggravation of the evil it was intended to remove.

Healthy Hands, Applications for. Normally healthy hands require no other applications than of warm water and vegetable soap, or cornmeal or oatmeal. The use of oatmeal as a cosmetic cannot be over-estimated. Its effect upon the skin is most soothing as well as nourishing. It is prepared as follows: Boil some good oatmeal in water for an hour, after which strain and use the liquid as a wash. It is an excellent softener, but it must be prepared in small quantities, as it soon becomes sour. The following preparation will also be found useful for whitening and softening the hands: Melt together equal parts of cocoa butter, oil of sweet almonds and refined wax; then stir the mixture until cool. Apply before retiring.

Massage. For developing and beautifying the muscular structure of the hands, massage is very beneficial. This should be done with lengthwise movements. Each finger, after the skin has been softened with cold cream or olive oil, should be rubbed from the tip to the base, and the tip should be gently pinched at the side to make the finger, usually flattened by occupation, return to its natural tapering form. The back

of the hand should be rubbed in lines extending from each knuckle to the wrist, with intermediate light pulls or pinches crosswise. The palm should be massaged toward the fingers also, with intermediate rotary movements toward the center.



Here is shown the proper manner of using the orange wood stick which should be employed to push back the cuticle from the base of the nail. This step in the manicuring of the nails should be performed gently and with care, in order to prevent disfigurement of the nails or of the ridge of skin which surrounds them.

Massage for Enlarged Finger Joints. Massage is also useful in reducing enlarged joints, that is, apparently doing so by developing the fleshy structure contiguous to them, so that a more rounded contour of the hand is produced. It is only, however, when the enlargement is caused by occupation that massage should be used. When the trouble is due to chalky deposits, the operation is painful. The proper treatment of such cases is dieting, since the deposits are the result of eating meat, drinking alcohol, etc.

Massage for Nervous Weaknesses of Hands. Massage is decidedly helpful as an auxiliary of constitutional treatment in curing twitching of hands and twiddling of thumbs and the excessive perspiration which often accompanies these indications of a nervous condition. As a relief for the perspiration the hands may be covered over night with a fine cornmeal or rice powder.

Toilet Preparations for Hands. As a rule all powders and toilet preparations, skin bleaches, skin foods, etc., are to be avoided, as in time they dry up the skin by combating and hence discouraging the natural perspiration of the skin through the pores by which the proper secretions are supplied as well as waste matter eliminated.

Manicuring. It is essential for rightly treating the nail, to know its anatomy and physiology. Very few



Massage is also of value in beautifying the hands. The fingers should be firmly kneaded and massaged from tip to base. Pressure should be applied at the sides of the fingers only, as illustrated, in order that the massage may tend to taper rather than to flatten them.

of even the professional manicurists are acquainted with even the simple fact that the nail is a skin formation, continuous with the cuticle and arising from the true skin which nourishes it. Accordingly they treat it as if the skin had no other relation to it than the mechanical one of container or setting.

Nature strives to have each nail conform to the shape of its finger. It should therefore be the aim of the manicurist to aid this purpose, not to combat and nullify it. Thus fanciful shape for nails which have been in vogue in the profession, such as the "rose-leaf," and "shield," and "talon," are abhorrent both to common sense and taste. It is vulgar to thus parade one's nails.

The special instruments used in manicuring are few and simple: Clipper, cuticle scissors, flexible steel nail file, steel cuticle knife, buffer, emery board, nail brush and orange wood stick (see illustrations), and the special preparations are still fewer, consisting of rather unnecessary nail bleaches, powders and creams.

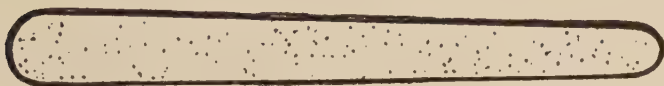
The first step in manicuring is the thorough massage of the fingers, the next the trimming of the nails, then the cuticle is pushed back from the base of the nails, and finally the nail is rubbed or polished to a rosy glow.

Improper methods of cutting the nails are often responsible for badly shaped finger tips. The nails act as a support for the flesh, and if they are improperly trimmed the result will be that the flesh, having nothing to cling to, will sag, and a flat, thick tip will develop. Those who have naturally wide nails should not try to cut away the sides in an effort to make them appear narrow and pointed. This is not only useless but harmful, and will end by making the tip of the finger thicker than it was. The nail should not be cut too short, for the same reason. If the nails are brittle and break easily, their condition can be improved by soaking the finger nails in warm olive oil for about fifteen minutes every night before retiring.

The file is preferable to the scissors for cutting the nails, as cutting thickens the nail and causes it to lose its transparency. The use of the file is very quickly learned and much



Nail file.

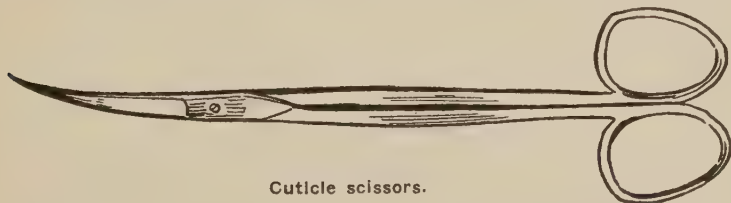


Emery board.

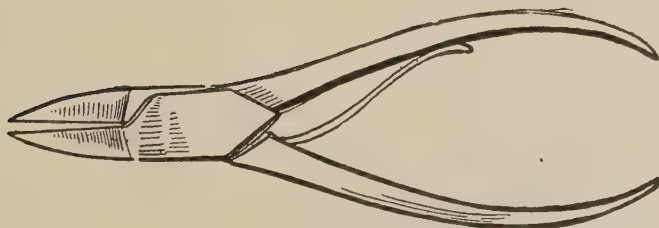
better results obtained. In filing the nails, the file is held between the nail and the flesh and not at right angles with the nail. (See page 1174.) Care must be taken, however, not to go too far into the corners or the result will be the thick tips mentioned as the outcome of improper trimming.

Never do any work on the cuticle at the base of the nail unless the finger tips have been soaked for about five minutes in warm, soapy water in order to soften the skin. If the cuticle is pushed back without having been previously softened by the soapy water it is apt to break or tear in the operation and cause "hang nails."

The very best way to loosen the cuticle is to bathe the finger tips in olive oil; about five minutes will usually be sufficient to soften it, so that it can be pushed back with an orange wood stick (see page 1176), but if the nails are very much overgrown do not persist; instead give them another oil bath. If there is quite a ridge of skin formed at the base of the nail after it has been pushed back, it may be necessary to clip a little off



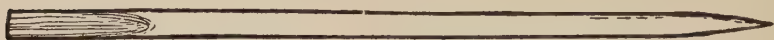
Cuticle scissors.



Nail clipper.



Steel cuticle knife.



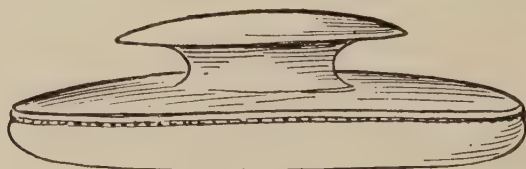
Orange wood stick.

with the rounded scissors made for the purpose, but only a very little should be cut. Cutting tends to thicken the cuticle, therefore it is better to push it back, with only an occasional trimming. Such treatment will cause the "half moons" so necessary to insure that the nails are well defined.

Now, after treating the base of the nail, wrap a tiny bit of cotton about the pointed end of the orange wood stick; dip into peroxide of hydrogen, and clean the outer rim of the nail. Clean the nail only, don't rub the skin under it, as it will cause the skin to become ragged and uneven, thus forming little crevices for the dust and dirt to cling to, which will result in unsightly dark rims around the finger tips. It is for this reason that sharp-pointed instruments are to be avoided for cleaning the nails.

Finally polish each finger nail with a buffer, or an ordinary piece of chamois. Three or four strokes will be sufficient, as a very high polish is not in good taste.

About a month of the treatment advised will bring about a great improvement in most cases, and in order to keep the hands in the condition attained they should be carefully manicured at least once or even twice a week.



Buffer for polishing nails.



Nail brush.

Brittle Nails. Nails, like other parts of the body, suffer from ill-health, which is indicated by their appearance and condition. If there is a lack of lime in the system they become brittle. The constitutional remedy is, of course, a resort to proper diet. This may be aided by a local treatment of the nail with a mixture one-half of which consists of white wax, and the other half of equal parts of salt, resin and alum, melted together with the addition of a little almond oil. This treatment is also effective in the case of ridged nails. Do not use polishing powders upon nails in ill-health, and avoid varnishes, rouges, etc., for nails in any condition.

White Spots. White spots may be removed by applying over night a mixture of equal parts of refined pitch and myrrh. This should be removed in the morning with the aid of olive oil.

Bruised Nails. A bruised nail may be kept from turning black with clotted blood by immersing it for half an hour in water as hot as can be borne, and wrapping it over night in cotton soaked with witch hazel. The finger should not be used for a day or so after this treatment.

THE SKIN AND ITS CARE.—The skin is generally conceived to be a simple covering for the body, an outer garment of tissue which serves to enclose and protect the parts within. It does all this, but its functions are far more extensive and elaborate than merely giving shape and form to the body. Roughly the skin may be divided into two portions, the deeper layer, called the *corium*, or *derma*, or true skin; and the outer layer, called the *cuticle*, scarf-skin or *epidermis*. This outer layer is merely composed of dead cells; is unfed by arteries or nerves, and consequently lacks sensation. It serves to protect the under skin from contact with solid substances, which would otherwise prove painful, as we discover when we abrade our finger. Although it may appear at first sight an unnecessary appendage to the body—this outer layer of dead skin—it is, nevertheless, one of our greatest protectors, since whenever it is removed it is possible for us to acquire, upon contact, various blood diseases from which the epidermis protects us.

The skin is very complicated in its structure. Besides the layers before mentioned, there are thousands of sweat glands and ducts scattered throughout it, and an elaborate arrangement for supplying and feeding the hairs throughout the surface of the body.

The *color* or complexion of the skin depends upon its outer or epidermal layer. If this were entirely removed the surface would be of almost a blood-red color, owing to the abundant blood vessels found everywhere in the corium.

The difference in color between the blonde and brunette is due to the pigment which lies in the scarf or outer skin. Even in the whitest skins this pigmentary principle, though to a much less degree, is present. Thus the different shades of color seen in people depend upon the amount and depth of hue of the pigment contained in the granules of the epidermis. In the darker races these granules are of a dark yellow, approaching to almost blackness in the negro. In the fair inhabitants of



Frequent and vigorous massage of the face and upper parts of the body is a great aid to beauty building.

the North they are pale. The heat of the sun increases the formation of the pigment, which explains why in summer exposed parts of the skin become brown, while in winter, this stimulative factor being absent, and the summer epidermis wearing off, the light complexion is renewed.

The blood and nervous structure of the skin is highly

complex. Sweat glands situated throughout the body act as excretory organs, and are shaped like corkscrews. At some distance below the surface of the skin this corkscrew-like tube ends in a gland which resembles a coil of the tubing roughly thrown together. The little sweat-gland tubes are exceedingly minute, being, it has been computed, but one-four-hundredth of an inch in diameter; while the number scattered throughout the body would amount to something like two million, four hundred thousand!

Although this brief anatomical description of the structure of the skin may not seem at first sight to bear directly upon the complexion and its preservation, it can be shown that this is so, nevertheless. For, when we know that the glands situated on the surface of the body are not straight tubes, but twisted or corkscrew-like, and are not short, but on the contrary of great length, comparatively speaking, we at once see the fallacy of attempting to rub various greases and "skin foods" in, with the idea that they will be absorbed into the circulation, and so help nourish the parts. All the "nourishment," in such cases, comes from the added blood supply, which is brought to the part by the massage, and the so-called "skin food" can add nothing permanently in the way of healthy tissue.



Applied in this manner, preparations of a proper sort will be found effective in healing chapped lips.

The skin being an excretory, and not an assimilating organ, it is impossible for it to absorb material from the outside; for it is specially constructed in order to allow all solid matter to pass in one direction, while forbidding it to repass in the other. Were this not the case, the skin would be constantly absorbing into the circulation all kinds of foreign and poisonous elements, whereas its chief duty is to prevent their ingress. All that greases and "skin foods" can do, therefore, is to stimulate the circulation; or, by blocking the minute orifices of the sweat glands, to cause an artificial retention of material, which material, as a matter of fact, should be eliminated! The fallacy of using such preparations is therefore obvious.

Powders. Dr. Hugh Black, in his work on *The Skin*, says:

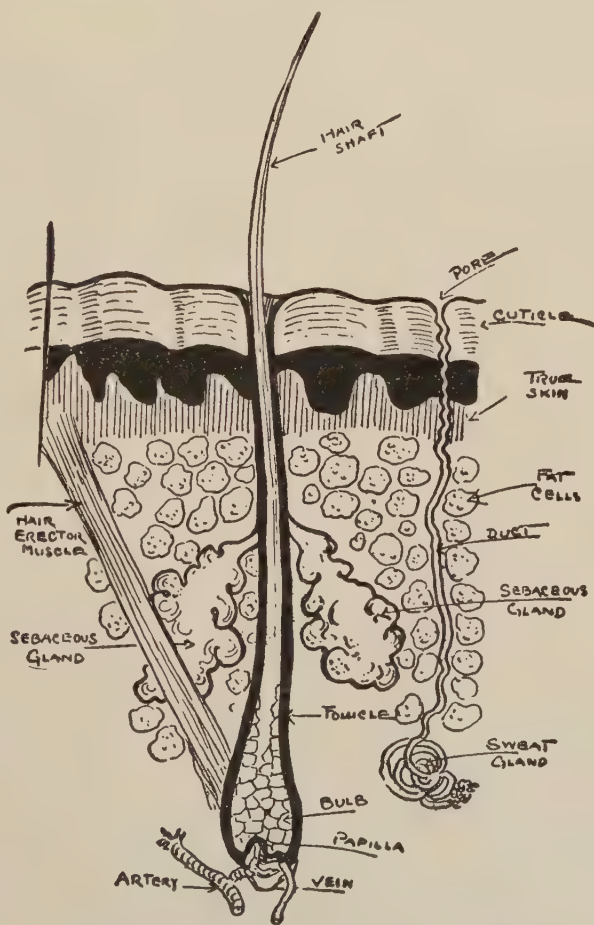
"Powders are very largely used by many ladies to cover the defects of the complexion, and the question is continually asked whether their use is injurious.

"I reply that I have seen a number of instances where eruptions of the face have been directly traceable to some of the toilet powders and cosmetics sold in the shops. Therefore, as their composition is secret, and as some of them, by analysis, have been found to contain very poisonous ingredients, as large quantities of lead, and as others are known to be detrimental to the skin, they should be avoided as a class, however seductive the advertisements, or however positive the assurance on the part of druggists or friends that they are perfectly harmless."

Perhaps the best application for removing greasiness of the skin is pure *rice powder*. A certain amount of friction daily applied to the face will serve to keep the pores well open and prevent the formation of red spots, blackheads, etc., so frequently seen. An excellent way of flushing the pores of the skin of the face and head is to hold the head over a jug of boiling water, to which has been added several tablespoonfuls of eucalyptus. If the head be held in the steam and covered over with a thick towel, it will soon break out into a profuse perspiration—an excellent treatment also for colds in the head.

Many health-reformers contend that *soap* should never be applied to the face. I reply, it all depends upon the soap. If this be pure and harmless in character, there is no reason why the face should not be washed in soap and water, as is every other portion of the body. In fact, it is quite possible that much of the skin trouble that arises on the face is due to the fact that soap has *not* been used. Several authorities on the skin agree in recommending old castile soap as the least harmful, and most cleansing in its action. "Medicated" soaps are, as a rule, a farce.

Massage of the face will be found exceedingly beneficial in certain cases, invigorating and strengthening the skin. Care should be taken, however, that massage is performed by an expert, or at least by one who knows the direction of the underlying muscles, for if the face be not massaged in the proper direction, more or less disastrous results will frequently follow. The face should be gone over each morning with a flesh brush, scrubbing equally all parts of the face, reaching every



Cross-section of human skin with hair shaft.

corner. Alternate hot and cold compresses applied to the face have been found to relieve long standing skin trouble, and almost instantly clear the complexion. A certain amount of sunshine upon the face will prove beneficial; but this should not be overdone, since recent experiments have shown that an excessive amount of sunlight is exceedingly harmful to all living protoplasm, the tendency being to destroy the healthful tissue, if too long continued.

Some authorities on "beauty culture" assert that an excellent method of massaging the face, and one that is quite harmless, is to twist and pull the muscles about in all directions, not with the hands, but by means of the muscles themselves; that is, they advise the patient to "make faces." There is no reason why this practice should not prove beneficial, adding to the flexibility and elasticity of the muscles, and stimulating the blood supply to the parts. Five or ten minutes daily practice should improve the character and texture of the skin in almost every case. For details see *Exercise for the Face* on page 693.

It will be seen from this that the two practices necessary to keep the skin in health and beauty are: cleansing, to remove all impurities and keep the pores free, and friction, to induce a life-giving circulation. Back of these, of course, lie proper diet and general bodily exercise, which have been discussed in other parts of this work. It will not be superfluous, however, to introduce here a few remarks on diet as specially intended to produce a beautiful complexion. A diet of uncooked foods, for instance, has many features that are of very great value in cleansing and improving the color and general character of the cuticle.

Perhaps about the best diet for quickly changing the condition of the skin is that in which the food consists solely of milk. The milk diet flushes the entire functional system—the arteries, the capillaries, the veins, and all parts of the tissues—with a new supply of nourishment, rich in all those elements needed to revivify the body. A muddy complexion assumes the pinkish tint of youth after its possessor has followed a milk diet but a few short weeks.

Chapped Skin. This is due to two causes—the internal nutrition and the external atmosphere. If the food be lacking in food salts, this may cause the hands to chap. An abundance of fresh fruits in the diet will prevent this. Meat should be avoided for some days, when chapped hands first appear. Plenty of water is essential.

The hands should be washed in warm water, rinsed in cold, and *thoroughly dried*. This latter point is very important. A soft alkali soap should be used, though it would be better to use no soap at all for a few days, if possible. Rub the hands with olive oil every night, and on arising in the morning. It would be a good plan to place the hands in old gloves, at night, after rubbing them with oil, to prevent the sheets from becoming soiled. This will also protect the hands more fully.

Dry, Scaly Skin. Dry, scaly skin should be massaged with olive oil, or cocoa-butter, since the cause of the condition is a deficiency of the natural sebaceous or oily secretion. On the other hand, oily skin and enlarged pores, which are due to an over supply of this secretion, should be massaged without oil, and, in extreme cases, with lotions consisting of rosewater, milk of crushed almonds, and a little alum, the almonds and the alum having astringent properties.

Eating oily and fatty foods for a time will doubtless help this condition. The milk diet might prove very beneficial in this case. Be sure that the bowels are kept open. When following an ordinary dietary, plenty of water should be used. Acid fruits are beneficial. Exercise in the fresh air. Keep the skin open, by water applications and Turkish baths.

Enlarged Pores. A condition usually noted on the face, and causing inconvenience because of its unsightliness. The treatment consists chiefly in opening the pores all over the body and deterring the expulsion of impurities, as much as possible, through the pores of the face.

Frequent Turkish baths would prove beneficial in a case of this character; also frequent hot baths. Alternate hot and cold cloths to the face would be advisable, always ending by the cold cloth, which may be applied like a pack. Some mild

astringent may be employed, to contract the skin, though this should not be too strong. Avoid all greasy foods and drink plenty of lemonade and acid fruit-juices. Take good care of the general health, including plenty of active exercise.

Moles. For moles the electric treatment is necessary if one considers these marks, which properly are not diseased conditions, to be disfiguring. Like sunburn and freckles they do not affect the health, and are therefore not offensive to the person who has the right idea of what constitutes beauty. Where facial disfigurements are abnormal, as in the case of birthmarks and superfluous hair, their victims cannot be blamed for desiring their removal. Skilled operators of the electric needle can do much in remedying these.

Moth Patches. (Chloasma.) This is a form of discoloration of the skin. It may be a species of pigmentation, in which case nothing can be done to cure it. Patches of this kind sometimes coincide with pregnancy, or follow it; in which case the marks may, to a certain extent, be removed by a truly hygienic mode of life, combined with great abstemiousness.

Liver Spots. See Volume IV, pages 2172-73.

Pimples and Blackheads. The method usually followed in removing a pimple is to squeeze the tissue to such an extent as to force out the matter that usually accumulates within it. This in many cases will remove the defect, though a red spot often results, and in some cases the pores of the skin about the affected part are thus permanently enlarged. Blackheads are frequently removed in a similar manner, that is, the tissues are squeezed to force out the matter or pus which usually forms the blackhead. This also, in nearly all cases, results in permanently enlarging the affected pores of the skin.

Now, the best way to remove pimples and blackheads is with dry friction. To treat the face in this manner, secure an ordinary complexion brush and brush the skin of the affected part up and down, back and forth, from side to side, and diagonally, continuing the process until the skin is very red from the acceleration of the circulation of the blood brought to the surface by the friction.

Even in those cases when this treatment does not immediately eliminate all blackheads or pimples, if continued two or three days you can rest assured that the eruptions will disappear. This friction incurs no bad after-effects. The skin is cleansed and improved by the treatment.

If one has a large number of blackheads or pimples it is sometimes a good plan to steam the face. This, of course, softens it and enables one more easily to remedy the disfigurements referred to. It is usually a good plan to first of all give the face a dry friction bath with a complexion brush, or a rough towel, then to give the face a steam bath, which should be followed by massage, kneading all parts of the face slightly, but giving special attention to the affected parts.

After massaging the face (or during the massage), a good grade of cold cream could be used, or what is better still, olive oil with the greenish color removed. All this tends to accelerate the circulation to the affected parts, very thoroughly cleanses the pores, softens the tissues, and is inclined quickly and radically to remedy disfigurements of the skin.

Florid Complexion, Red Nose, etc. An excess of blood in the face is the cause of these conditions. This itself may be caused temporarily by one of several things and the condition will become chronic by making the cause a habit or by allowing it to continue for a considerable period of time. Alcoholic beverages were formerly a common cause and still are in some instances, but there are other causes. Hot beverages and hot soups will flush the face. Constrictions about some part of the body, as tight collars, gloves, corsets, girdles, belts and shoes will force extra blood to the face. Long and frequent exposure to sun, wind and harsh weather conditions is frequently responsible for too ruddy hue, as these cause congestion of the blood vessels, which may in time become chronically dilated and congested. Plethora, high blood pressure and organic heart diseases are conditions that produce floridity, the degree of which depends upon the degree of the causative condition. And of course certain skin diseases and certain abnormal conditions of the nerves of the skin affect the complexion in this

manner. The same conditions that so injure the complexion as a whole will cause the nose to redden, though digestive disturbances, and especially dispepsia, are a frequent cause of red nose. Insufficient clothing on cold days and the pressure of the pince-nez are also occasional causes.

Naturally the cause must be found and removed, when possible. Remember that these troubles are circulatory defects and are not due to troubles in the skin itself. If the blood is kept from one part it must go to another and constriction, even of tight gloves, must be avoided; also, if the circulation is over stimulated or if the blood is retained in one part too long there will be a congestion that will in time become chronic, if the circulation is not normalized. Local applications of salves, lotions, etc., will be disappointing in results so long as the cause remains effective; but cold water applications or alternate hot and cold applications, with perhaps *gentle* massage, will help in those conditions not due to organic heart diseases or high blood pressure. Definite steps must be taken to remedy these by a strict physical culture regimen, such as described for them in volume IV. In any case, general treatment will be necessary for most prompt and satisfactory results.

Sunburn is a painful affliction against which anyone who has naturally tender skin would do well to take adequate precautions. The effect of the sun upon the skin varies according to the texture of the cuticle; thick skin tans, the oil and thickness of it offering a greater resistance to the sun so that it cannot burn quickly enough to blister. On the other hand, thin and dry skin becomes red, blisters and peels.

Bathing and swimming can be indulged in without injurious sunburn if the face, neck and shoulders, and even arms and hands, be given a *temporary* coat of pure cold cream, the grease protecting the skin. This can be applied so as not to be objectionable if the cream be rubbed well over the parts, and then lightly dusted with a pure rice powder.

A good cream for this purpose is made of one ounce of white wax; four ounces of almond oil; one ounce of spermaceti. This treatment is especially good for those having

delicate skins, upon which the action of sea water is particularly injurious. Upon emerging from the bath a toilet water or solution of borax should be used *at once* to remove all of the grease.

In the event of this precaution not having been taken, one can do much to alleviate the pain resulting from the exposure by applying cold wet packs to the affected parts. It is more convenient to apply these packs at night. If the burn has extended over a large surface an article of clothing worn next the skin can be wet and worn at night.

Chapped lips are readily cured by rubbing with mutton tallow, or by applying cold cream nightly to the lips before retiring.

Freckles. A few simple directions for removing these are as follows: Prepare a lotion of one ounce of lactic acid, one ounce of glycerin and six ounces of rose water and apply this with absorbent cotton two or three times a day. Applying the juice of a lemon to the face daily is also advised for the same purpose.

Wrinkles are not really an affection of the skin, being due to the lack of adipose tissue underneath the skin. In the case of wrinkles of the brow and about the eyes they are often signs of mental condition. Concentration of thought leads to the sympathetic contraction of the muscles of the brow, with the result that wrinkles become a permanent index of the habit.

In a great number of cases, worry is the greatest cause of wrinkles, and unless you expel from your mind this, its greatest enemy, you will be merely wasting your time by trying to get rid of wrinkles.

But wrinkles are also due to physical causes, such as defective circulation and innutritious diet, which, by lowering the vitality of the system, are unable to expel from the tissues those dead cells that in perfect health are eliminated, and so cause anemia, or impoverishment of the blood, and emaciation. An improper diet will generally be indicated by constipation, the result of which is the retention in the system of waste matter that breeds poisons. You cannot expect to have

a clear, smooth skin with your body reeking with impurities.

With wrinkles comes the appearance of old age. They make one seem much older. With their removal there is always a decided change. One appears younger and more vigorous, more alive and awake. Wrinkles and senility are very closely associated.

In the case of wrinkles it is always better to prevent their appearance than to cure them, once they have appeared. A little care as to diet, and proper massage of the face, coupled with such exercises as are calculated to strengthen the face and neck muscles will keep the face young and fresh looking, as Mr. Sanford Bennett and others have proved. There is no reason why wrinkles should appear with old age; and the fact that they *do* is only another indication that the organism has not been properly cared for during the earlier years of life.

Should wrinkles appear, however, the harm is done, and the next thing is to get rid of them! The pores of the skin should be kept active, by means of hot and steam face baths, etc., so as to make the muscles soft and pliant. They should then be carefully rubbed and massaged by means of the hands, *in the direction of the muscles of the face*—and upward, and *never* downward or crosswise, to any extent. Small balls are used for this purpose, and will be found very efficacious. The Japanese use a specially constructed “massage ball,” which is very good in a number of cases. You must study the anatomy of the muscles of the face if you wish to treat your own face, though it would be far better to have someone else (a skilled operator, preferably) treat your face for you, if possible. After the treatment it would be a good plan to rub the face with buttermilk. This will be found very beneficial, and will keep the skin soft and in good condition.

In the case of newly formed wrinkles, the following application has been found effective: Strips of soft linen are dipped into the white of an egg, and after being smoothed out, are placed directly over the wrinkle and allowed to remain about five minutes. A rather strong astringent that will draw together the loose skin will be found in the following: Rose-

water, six ounces; elderflower water, two ounces; tannic acid, ten grains; tincture of benzoin, one-half ounce. When using benzoin to beautify the skin, do not use compound tincture, which contains other ingredients which are unsuitable for the purpose. Ask for simple tincture of benzoin. Vinegar and alcohol are also generally employed as astringents, but I am opposed to their use, as they dry the skin and impair its nutrition.

Warts may be removed by the treatments of the electric needle or the stick of lunar caustic, or by moistening daily with carbolic acid, but, as these are apt to leave small white scars, it is best to remove their cause by adopting a careful diet and keeping the skin scrupulously clean. Drinking a tablespoonful of lime water twice a day will often prove beneficial.

TEETH, CARE OF.—There is no feature in which health and beauty appear more plainly identical than the teeth. The perfect shape and the clear tint of these “pearls of the mouth,” as well as the rich color of their coral setting, the gums, are all indicative of vigor and vitality in their happy possessor. Furthermore, teeth form the clearest of demonstrations that the best diet for man is the simplest and most primitive. Savages who live on uncooked food, such as nuts and seeds, which require cracking and crushing, are noted for having fine, sound teeth, whose condition is plainly due to their vigorous exercise. If civilized man had retained this diet there would be no demand for toothbrushes and dentifrices, and dentistry would be the least remunerative of professions.

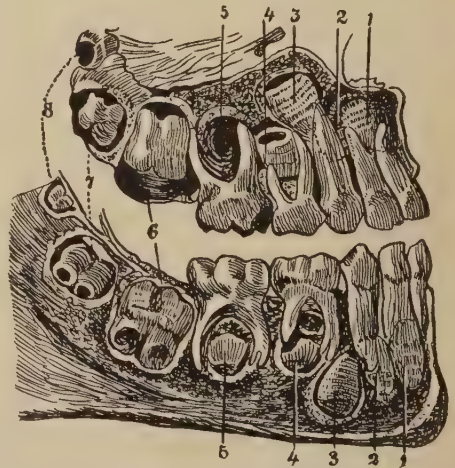
However, since but few people relatively have had the will power to revert to this natural diet of uncooked food, and the eating of prepared food such as meats and mushes prevails, affording little exercise for the teeth, and many opportunities for decay, toothbrushes, and tooth powders, and the service of the dentist are necessary, and advice upon these matters is profitable and even imperative.

There is abundant reason for an effort to awaken a general interest in the prevention and arrest of the process of

decay in human teeth. That there has been a progressive deterioration in the quality of the dental outfit of mankind through successive generations is claimed by many observing practitioners of dentistry. Yet the value of a good set of teeth can hardly be over-estimated. Not only are they beautifiers of the face, but their service, in keeping the body in a healthful condition, is one of great importance. If the teeth are defective, food is improperly masticated, the result being that disorders of the digestion, and other pathological states, soon arrive.

The number, the position and general structure of the teeth is probably too well known to need recapitulation, and can be found in any text-book on physiology. So long as the covering enamel of the teeth is sound, the teeth, other things being equal, will not decay; but once this protecting wall is ruptured, or the teeth are attacked from within by defective nutrition, they will deteriorate, and a visit to the dentist's will soon be a matter of necessity.

The eruption of the teeth is a natural process, which, under conditions in every way favorable, may take place with little or no disturbance or discomfort to the child. Contrary to common belief, the gum is not actually *cut* by the tooth, but is absorbed from above it, as the tooth is pushed forward from beneath, the gum at this period being soft and pliable. Many physicians cut the gum above the tooth in the shape of a cross, hoping thereby to facilitate the appearance of the tooth, but it has been found that this actually retards and renders *more* difficult the appearance of the tooth, instead of facilitating it, as was thought! The tissue that is formed across the scar is

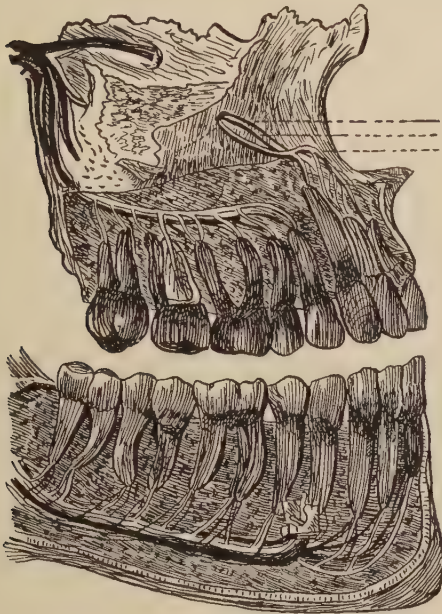


Temporary teeth, commonly called milk teeth. Figures 1, 2, 3, 4, 5, 6, 7 and 8 indicate rudimentary formation of permanent teeth.

more tough than the flesh, the result being that it is more difficult for the tooth to push its way through and make its final appearance.

If proper care be taken of the health of children, the temporary teeth should never suffer decay, and there should be

no difficulty in their replacement by the permanent teeth. As the permanent teeth approach their full development, a process of absorption is set up, by which the roots of the temporary set are gradually removed. Little by little the roots are dissolved and the particles composing them are carried away, until only the crown remains. This absorptive process does not begin upon the roots of all the temporary teeth at once, but in the order corresponding to their development and eruption. Deprived of their sup-



Showing permanent teeth, with the nerves and the blood-vessels that supply them.

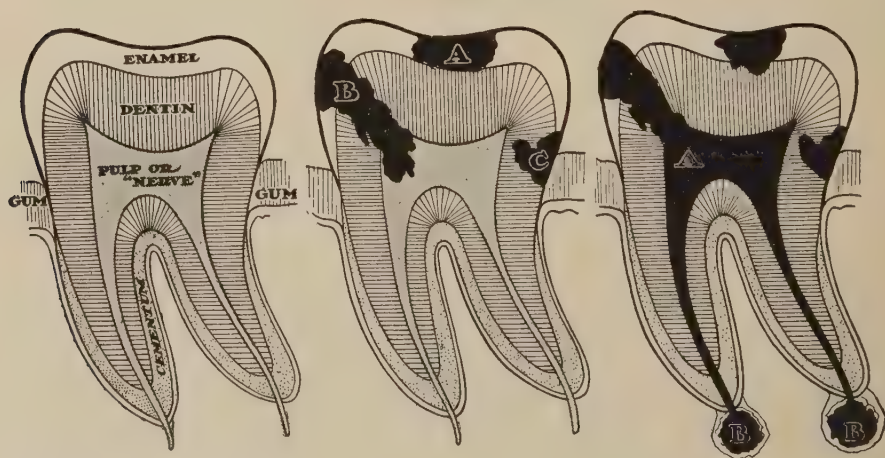
port in the sockets and retaining only a slight adjustment to the gums, the crowns are pushed out by the movement of the tongue, cheeks, or lips during mastication, or are picked out with the fingers.

Nutrition is the process by which the various tissues of the body are nourished. The source of nutrition is the blood, essential to the life of every portion of the body. The teeth are no exception to this rule, depending for their vitality on the blood. One of the large vessels which supply the external parts of the head give off branches, which are called the dental arteries. From these smaller branches are given off, which pass through openings at the bottom of the sockets, and then through the hairlike aperture (the foramen) at the extremity

of each root, through the canals of the roots, and into the cavity in the center of each tooth.

This question of the nutrition of the teeth is neglected far too much by dentists as well as laymen. It must be remembered that the quantity and quality of food eaten invariably affects the character and structure of the teeth, as they do any other portion of the body. It has been found by repeated experiment that the simpler the food, and the greater the care that is taken in diet, the harder and the more lasting will the teeth be.

The causes of decay in teeth are, generally speaking, two-fold: (1) through defective nutrition from within, and (2) from chemical and bacterial action from without. The former of these two causes I have already mentioned, and need here but re-emphasize its great importance. As to external causes, decay is chiefly due to various forms of chemical and bacterial action which may follow the use of improper foods and strong medicines; also the use of tooth powders and other washes of improper character. Decay has been caused by vitiation of the secretions of the mouth, either from a general derangement, or from a local cause, such as mumps, sore throat, etc. Doubtless the greatest cause of all, however, is the decay of food



In these diagrams are shown the structure of a tooth and the destructive effects of caries. The first picture shows a normal tooth. In the second, A shows beginning decay—the time to see your dentist; B shows decay to the pulp, giving rise to tooth-ache; C shows decay to the dentin at the gum margin, producing a sensitive tooth. In the third picture, A shows the pulp destroyed, and B shows abscesses at the two roots.

in and about the teeth. It is well known that, in fermentation and decomposition of animal and vegetable substances, acids are generated. The effect of an acid upon a substance largely composed of lime, such as the teeth, may be seen by the immersion of an egg in vinegar. In a few days the egg will be deprived of its shell. This exemplifies the manner in which the acid generated by fermentation of food, mixed with the secretion of the mouth, attacks, disintegrates and dissolves the lime of the teeth. Decay rarely or never begins upon the smooth surfaces of the teeth—those which are exposed to the friction of mastication—but always commences at points which, owing to their structure, or to their arrangement, furnish convenient receptacles for decay-producing agents. The crevices between the teeth form just such receptacles. Once the enamel has been dissolved at a certain point, decay proceeds at a rapid rate, due to the fact that the food substances are held in closer contact with the substance of the tooth, and not, as might be imagined, because the dentine is more susceptible to their action than the enamel.

It is a mistaken notion that sugars and sweet stuffs are excessively harmful to the teeth. Dr. George Black, in his excellent work entitled "The Mouth and the Teeth" (p. 116), says:

"Sugar and confections exercise no directly injurious effects upon the teeth, but when taken in excess do produce an acid condition of the stomach unfavorable to the health of the mouth; and, when left in the interstices of the teeth, rapidly undergo an acid fermentation resulting in a product capable of acting very injuriously upon tooth structure. Particles of candy remaining between the teeth will, in a single night, produce demonstrable mischief."

Regarding this last statement it may be said that *any* substance remaining in the teeth over night will produce mischief, and particularly is this the case with any animal compound, such as meat. Shreds of meat remaining between the teeth decompose very rapidly, as would be the case were they placed in any moist, warm locality. In order to keep the teeth in

good condition, they should be cleaned at least twice a day, morning and evening and, if possible, after every meal.

It is commonly known that acids, particularly, affect the teeth deleteriously and because of that fact, dentists will frequently admonish their patients not to eat fruits of the acid variety. This, however, is a fallacy; for although the mineral acids, or the acids resulting from decomposition, will destroy the enamel and cause decay of the teeth, the natural acid of fruits (such as the citric acid of the lemon, etc.), will have no injurious effect upon the enamel; and, in fact, the eating of an apple the last thing at night has the effect of cleansing and purifying the gums and teeth and seems to possess a germicidal property altogether beneficial.

The accumulation of tartar may only be prevented by thorough cleanliness, and the constant use of a reliable powder or mouth wash. Hydrogen peroxide is an excellent antiseptic wash, in the proportion of one part of the preparation to three parts of water. Dentists will remove tartar, but it must be remembered that unless the *causes of its accumulation* are removed, it will continue to accumulate. Only by removal of the cause can tartar be permanently eradicated.

Too much scouring of the teeth is as injurious as too little. Many sets of teeth have been ruined by too much, or injurious brushing of them. Skill and not force, faithfulness and not muscle, are required to secure the best results. The brush should be moderately soft, the bristles long and elastic and of uneven length so as to facilitate their introduction between the teeth. Once a day is often enough to use powder, preferably just before retiring, plain water being sufficient for the other cleansings. Lime water, as a mouth wash, can be recommended in full strength, or more or less diluted, where the secretions are fetid or where the animal constituents are in excess of the earthy in the composition of the teeth, or where there is special sensitiveness either of the dentine or of denuded roots.

Previously to brushing the teeth, dental floss should be used to remove any particles of food that may have lodged between them beyond the reach of the brush bristles. This thread

should be drawn slowly and firmly between every two teeth.

On this page are shown approved methods of holding the brush, and the motions to follow in brushing the teeth and the gums. In the top picture, at the left is shown how to hold the

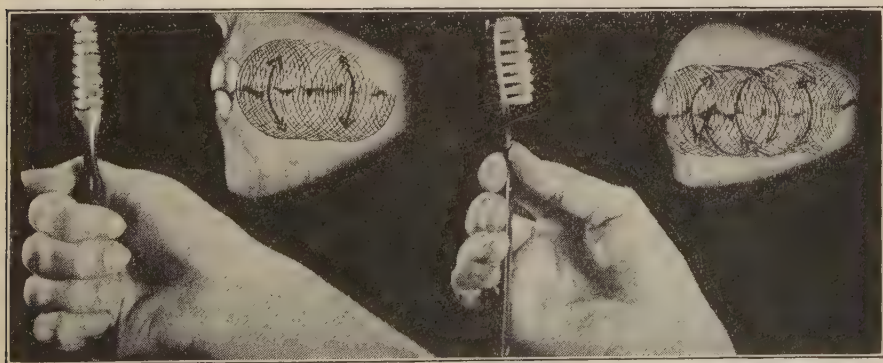


Showing how to hold on brush, and the cleansing motions for the inside surfaces of the teeth and gums.

brush for the inner surfaces of the lower teeth and gums, the picture at the right showing how to hold the brush for the inside surfaces of the upper teeth and the roof of the mouth.

The lower picture illustrates the proper manner of holding the brush for the outer surfaces of the teeth. At the right is shown the position of the hand and brush for the outer surfaces of the teeth and gums on the left side, the picture on the left showing the position for the right side. With the teeth nearly closed, start on the upper gums and bring the brush backward and downward, making circles with gradual progress from front to back teeth. For the lower teeth and gums use the same circular motion, reversing the operation.

Brushing the teeth should always be done with a rotary, and up and down motion, instead of straight side to side.



Illustrating the proper manner of holding the brush for the outer surfaces of the teeth and gums, and the circulatory motions to employ in brushing the teeth.

poses, and about two months is really as long as a toothbrush is fit for use.

It should be borne in mind that in cleansing the teeth, one should avoid the use of water which is either too hot or too cold. Such extremes of temperature are certain to have a deleterious effect upon the dental apparatus. It will be found that water used when cold will not prove as effective in cleansing the mouth as when used at a higher temperature. In many instances, particularly on arising, it will be found advisable first to rinse the mouth thoroughly with water of about the same temperature as the body, and to rinse it further several times with water of gradually increasing heat. Afterward it is well to rinse the mouth with water made gradually cooler, until moderately cold water can be used without shock. Hot water will be found a particularly efficient means of cleansing the mouth if a small amount of ordinary table salt is dissolved in it, and the subsequent use of cold water will be found an excellent means of invigorating the gums and the tissues of the mouth.

The plainest tooth powders are the safest to use, as they do not contain gritty substances or strong acids.

Tooth Powders, Washes, Etc. There are a number of these on the market, of varying worth. In order to keep the mouth and gums clean, all that is needed is a brush and pure water. To prevent the accumulation of tartar, etc., some antiseptic powder or paste is necessary. It may be said, however, that the plentiful use of fresh fruit, unsweetened, will go far in keeping the teeth clean and the mouth wholesome.

Of course the condition of the teeth depends, very largely, upon the kind of food eaten. In the first place, if one eats meat, the shreds and fine fibers are apt to become lodged between them and decay, causing no end of harm, through bacterial action. Mineral acids are thus formed, which eat away the hard enamel. Fruits rarely or never cause this deterioration of the teeth. Again, the internal nutrition of the teeth is an important factor, and the food must contain the necessary lime-salts, etc., for their preservation. If care be exercised as

to the quantity and quality of the diet, there need rarely be any trouble caused by decayed teeth.

The use of a mouth wash is to be advised because of its antiseptic qualities. A delightful mouth wash is made by adding a few drops of tincture of myrrh to a tumbler of water.

Where the gums need hardening, tincture of myrrh will be found most effective, and a good compound for cases where the

gums are spongy and sore and recede from the teeth is made of one-quarter of a dram of tannin, one fluid dram of tincture of tolu, one ounce of spirit of horse-radish and three fluid drams of tincture of myrrh. As for tartar—that enemy, consisting of salivary mucus, animal matter, and phosphate of lime



Dental floss provides one good way of cleaning particles from between the teeth.

—which encrusts the teeth, the first and most important step is to prevent it from accumulating by careful brushing of the teeth. If there is a considerable accumulation, due to neglect, it is not wise to attempt to remove it without assistance, as there is always the danger of an unskilled hand injuring the enamel. Failure to remove it, however, will result in the teeth becoming loosened and often inflamed, and the unsightly red gums frequently seen can be traced to it.

A great many people use powdered pumice stone to remove tartar from the teeth, but this should be done at very rare intervals—never oftener than once in five or six weeks. It is best applied by means of an orange-wood stick, the end of which is dipped into the powdered pumice stone and the teeth

rubbed with it. The mouth must be well rinsed afterward to remove all traces of it.

Medicines are responsible for discolored teeth as most people can testify. Those most harmful are iron and mineral acid preparations. If medicines of that nature have to be resorted to, they should be diluted and taken through a glass tube.

The deteriorating effect of a decayed tooth upon the general health is sufficiently serious to bear dwelling upon here. The presence of a decayed tooth in the mouth endangers the sound teeth contiguous to it, besides impairing the digestion and is often the cause of that most distressing complaint—offensive breath. Teeth in such condition should receive immediate professional attention, so that they can be either filled or removed. When decay seizes upon a tooth it works so insidiously that its rapid destruction is almost inevitable, and, therefore, at least two visits yearly should be paid to a reliable dentist if only for the purpose of examination.

Keeping the teeth in good repair is necessary not only for their own sake, but for that of the entire physical system. In order that the entire physical economy may bear its share of the work of sustaining the body, it is essential that the preliminary steps to digestion be properly performed, and this cannot be accomplished unless the teeth are sound and whole.

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